MESMETone

Mesmet One User Manual

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E-Smart Systems

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1.Application structure

Application structure is divided in four tabs (fig. 1.1):

1. ***Meters***
2. ***Customers***
3. ***Schedules***
4. ***Collected Data***

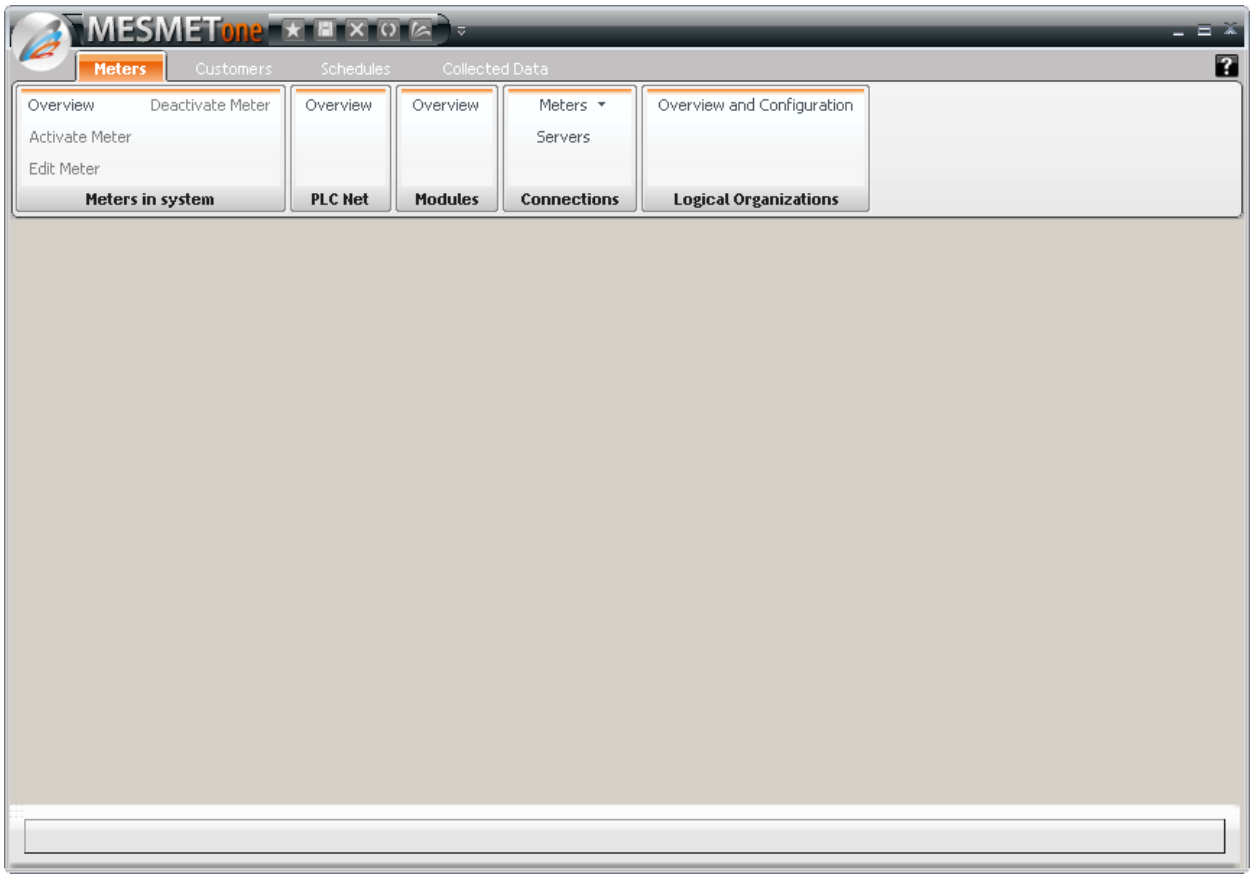


Fig. 1.1 MesmetOne application design

Main menu consist of five buttons: ***Add***, ***Save***, ***Delete***, ***Refresh***, ***Activate***. These buttons are used for basic application functions. After initial application starting, these buttons are disabled (can't be clicked by mouse), until one of controls is opened. Depending on control loaded, buttons can be enabled or disabled, and have different functions.

MesmetOne also has drop-down menu, activated by clicking on top left icon. Its options are: ***Configuration Parameters***, ***Start/Stop service*** and ***Exit***. After click on ***Configuration Parameters*** new window for application is shown (fig. 1.2).

Configurable parameters are:

Parameter	Default value	Details
numOfRetriesForTask	2	Number of retries for task execution
OnDemand_Event_Table_Refresh(m)	2	Refresh period for OnDemand commands, in minutes
Event_Table_Refresh(m)	2	Refresh period for event table, in minutes
PauseBetweenRetries	20000	Pause between retries
numOfRetriesForCompletedWithErrors	3	Number of retries of repeated readings for data collected with errors
PollRetries	3	How much times tries to call GPRS module to leave entry to DNS server
Archive Time interval(m)	360	Communication log archive period
PortAccessRetries	5	Number of attempts to reach port
Task_Table_Time_Window(min)	60	Task table developing period
Digits_Count	8	Count of digits shown
Log Files Path	c:\Program Files\E-Smart Systems\MesmetOne\log\	Log files storing path
Archive Path	c:\Program Files\E-Smart Systems\MesmetOne\log\Archive\	Log files archiving path
AutomaticSystemStarting	True	Is reading service started automatically when application is started

Option ***Start service/Stop service*** (text depends on service status) is used to manually start or stop communication. Service stopping is used when user wants to reconfigure system and change the settings that affect remote communication (e.g. to change way of communication with meter).

By clicking on ***Exit*** user leaves application.

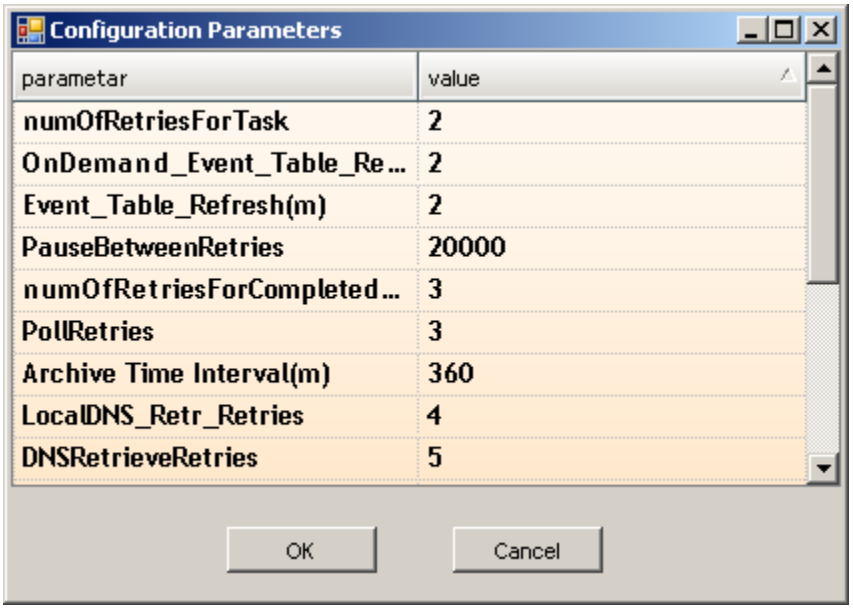


Fig. 1.2 Configuration parameters form

1.1 Meters

This part of application is divided in several groups: ***Meters in system***, ***PLC Net***, ***Modules***, ***Connections*** and ***Logical Organizations***.

1.1.1 Meters in system

This group consists of following buttons: ***Overview***, ***Activate Meter***, ***Edit Meter, Deactivate Meter***. Initially, after starting the application, ***Overview*** button is ***available***, while ***Activate Meter***, ***Edit Meter*** and ***Deactivate Meter*** are disabled (can't be clicked). After click on ***Overview*** these buttons become available.

1.1.1.1 Overview

After click on ***Overview*** list of all meters in system is shown (fig. 1.3).

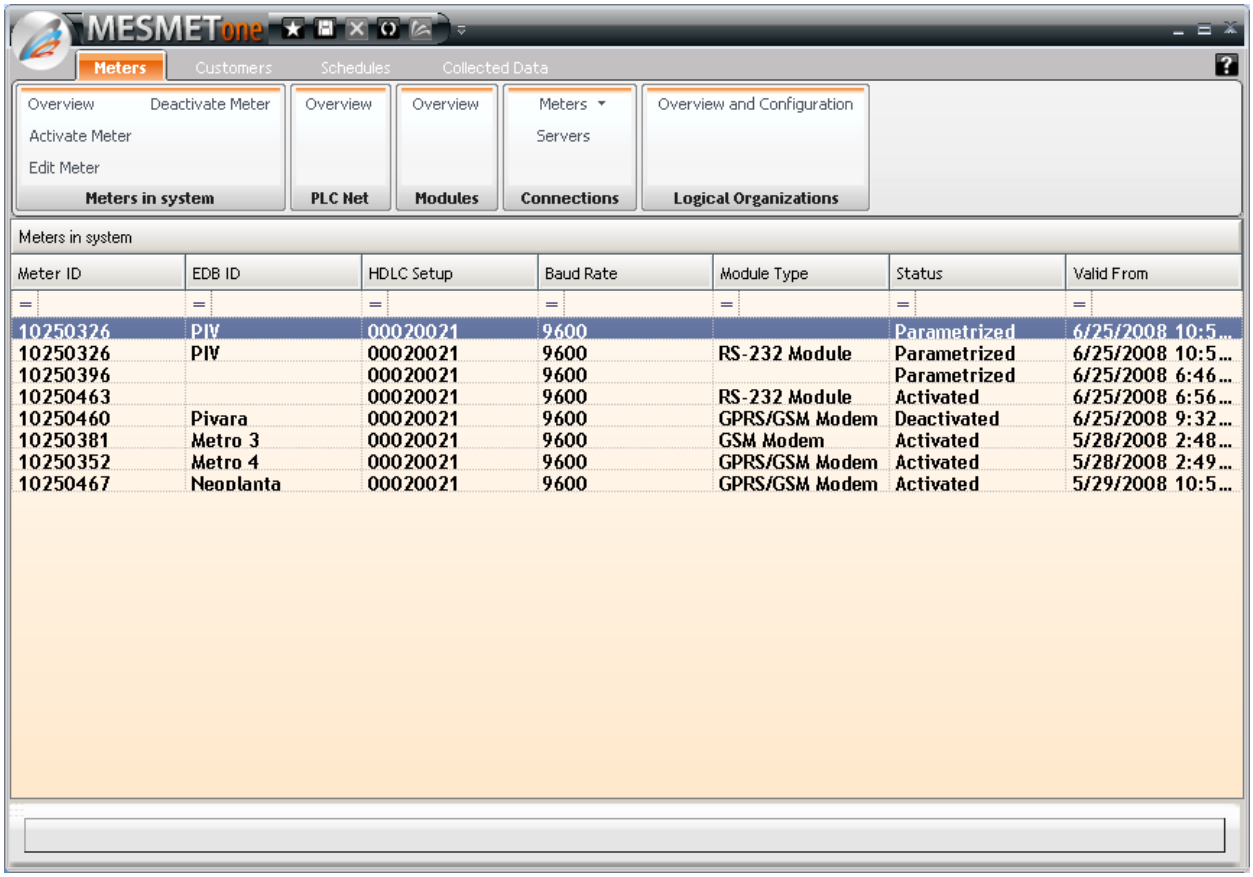


Fig. 1.3 Overview of all meters in system

For every meter, *Meter ID*, *EDB ID*, *HDLC Setup*, *Baud Rate, Module Type*, *Status* and *Valid From* (date of meter activation) are shown. First row in this grid is filter, allowing filtering and displaying only desired meters (e.g. display only active meters). Filtering is available for every column (*Meter ID*, *EDB ID*, *HDLC Setup*, *Baud Rate, Module Type*, *Status* and *Valid From*). Filtering can be done with positioning mouse on first row of column to be filtered. After that, an arrow pointing down is shown in this row, and after click on it, list of values for filtering is shown (fig. 1.4). Selecting a value from the list and pressing enter shows list of filtered meters in system. Filter is removed by clicking on button by arrow pointing down and pressing enter.

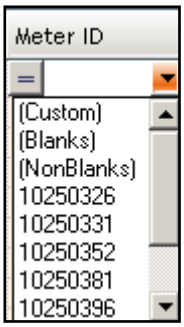


Fig. 1.4 Meter filtering

Meters in system can be in one of four statuses: *Parametrized*, *Configured*, *Activated* and *Deactivated*. Main menu buttons available on this control are *Add*, *Save* and *Refresh*. *Add* button is used for adding new meter into system. It is done by entering values for *Meter ID* and *HDLC Setup* of new meter into new row (displayed after click on *Add*) and clicking on *Save* button. After that, message about successful adding is shown in status bar. Columns *Status* and *Valid From* get new values - *Parametrized* and current date and time. Button *Refresh* refreshes meter list.

EDB is not entered when adding new meter. It's entered during activation process.

1.1.1.2 Edit Meter

By clicking on this button, meter configuration is started, and active meter parameters can be viewed.

Meter configuration assumes choosing of communication type for selected meter and its placement into predefined group (logical organizations. After click on this button, new control is shown (fig. 1.5), showing *Meter ID* and *EDB ID* (if exists) of selected meter, and current meter status, in upper half. Lower half of control has three tabs: *Direct Connections, Indirect Connections* and *Logical Organization*.

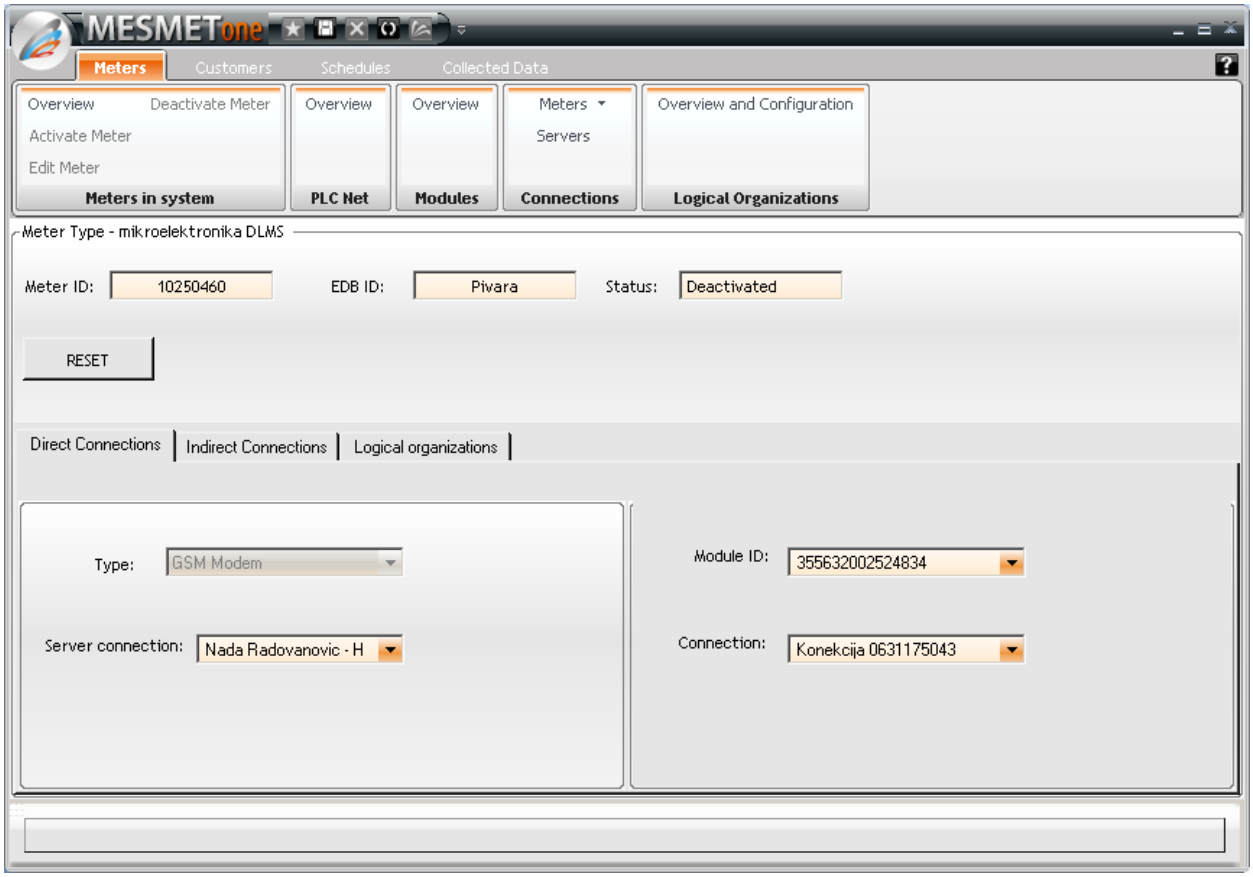


Fig.1.5. Activation of deactivated meter

There are two types of connections: *Direct* and *Indirect*. Direct connection to meter means communicating directly with meter via one communication module. Direct connection is available with following communication types: *GSM/GPRS, Zigbee, RS232, RS485 and Direct PLC.* Indirect connection means communicating with meter via indirect communication module (e.g. communicating with concentrator via GSM modem to read PLC meter). Supported indirect connection types are PLC, ZigbeeIndirect and *RS485*. As indirect communication modules, GSM or GPRS modems can be used.

Adding direct GSM connection (fig. 1.5) needs choice of GSM modem as connection type, selection of modem instance installed on meter (ModuleID), choice of SIM card in modem and connection to be used to communicate with modem (Server Connection).

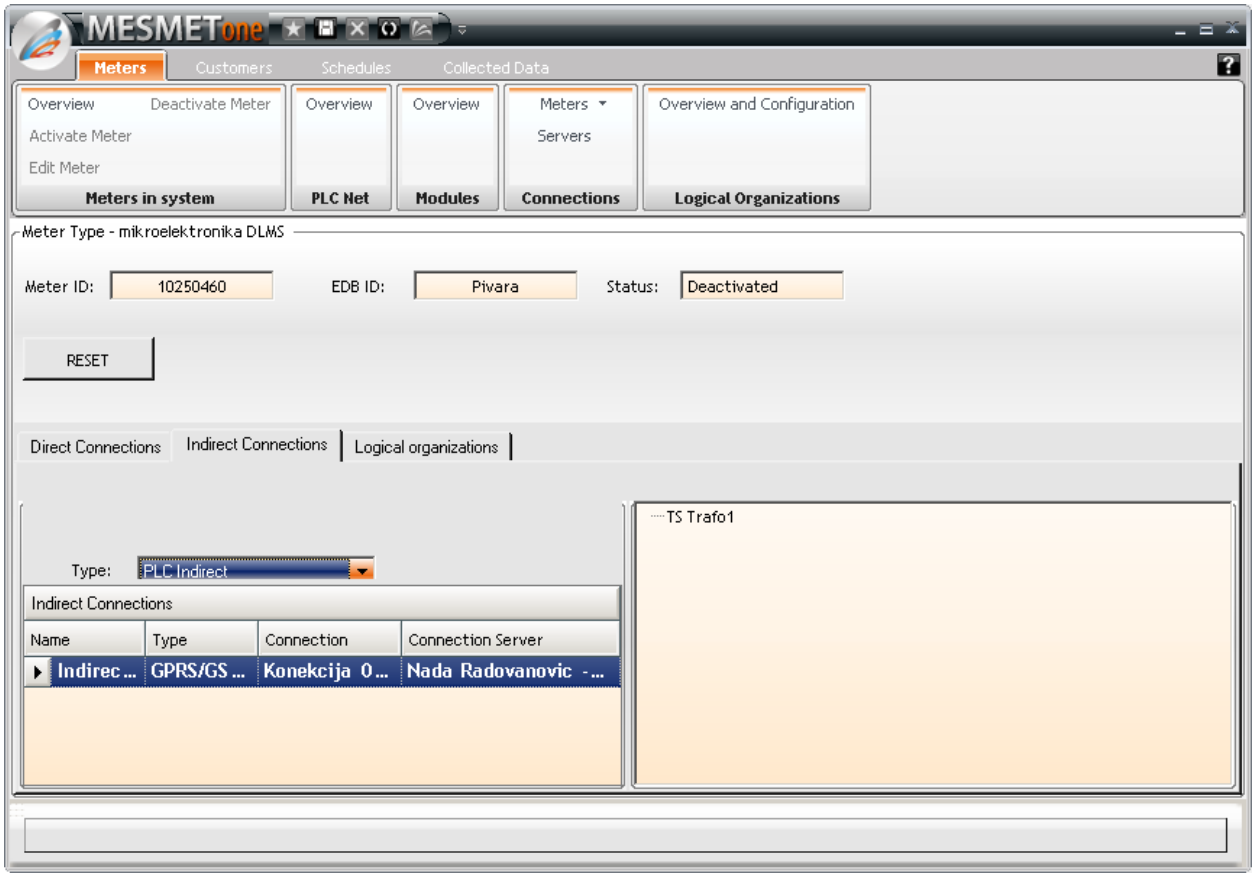


Fig. 1.6: Inserting of indirect PLC connection

If meter should be activated via indirect PLC connection, then *Indirect Connections* should be selected (fig. 1.6). From *Type* combo-box choose *PLC Indirect*, from *Indirect connection* list select (previously created) indirect used for meter activation, and select node from PLC network tree (on the right) representing location of meter in PLC network. After that, click on *Save* button in main menu is needed to save the changes.

After click on *Reset* and action confirmation, all communication settings for selected meter are reset, and meter status becomes *Parametrized*.

On this control, only buttons *Save* and *Refresh* from main menu are functional.

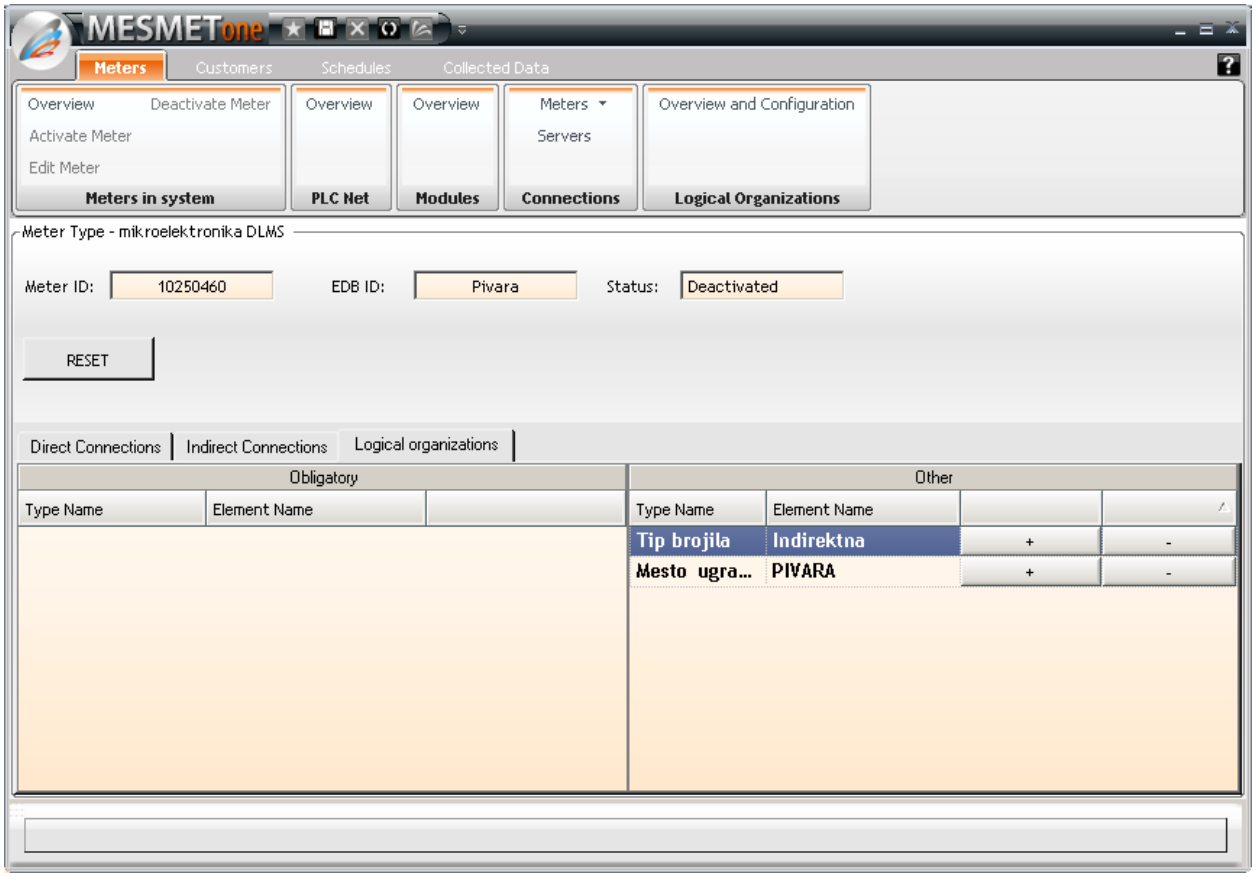


Fig. 1.7: Logical Organization

Third tab (*Logical Organization*) contains two tables. Left one (*Obligatory*) contains obligatory logical organizations in which meter must be placed during configuration process. It contains columns *Type Name* and *Element Name* used for type and name of all obligatory logical organizations. Third column has no name, and its rows have plus signs (+) as value. Click on (+) opens new, auxiliary form (fig. 1.8.) with tree view of all obligatory logical organizations elements. A nod with no children must be selected. Click on green icon keeps value of selected node, and red icon cancels the choice. This way logical organization element for meter is chosen. For every row in this table, obligatory logical organization element must be selected as described.

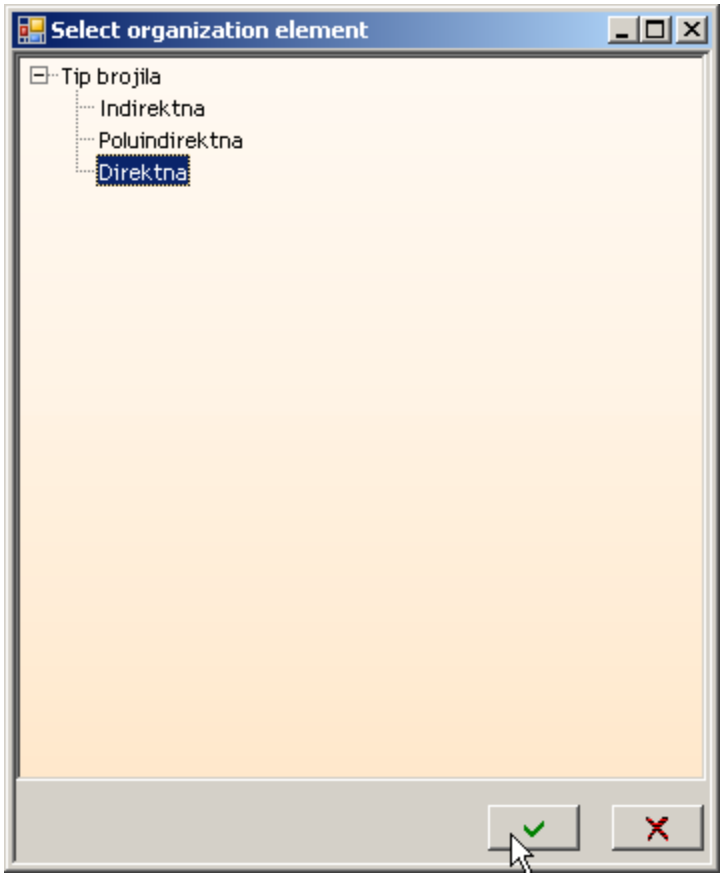


Fig. 1.8: Logical organization element selection

Table *Other* contains non-obligatory logical organizations. This table has columns *Type* and *Element Name* with type and element name of non-obligatory logical organization. Last two columns have no names, and their rows have values of plus (+) and minus (-). They are used to add and remove meter from logical organization. Non-obligatory logical organization selections are not required for meter activation. After click on (+), auxiliary form with tree view of all non-obligatory logical organizations elements (fig. 1.8) is shown. Handling this form is described in previous paragraph. Click on minus (-) removes meter from selected non-obligatory logical organization.

Click on *Save* button ends meter configuration and its status is set to *Configured*, and operation status is shown in status line. If all needed parameters (connections and logical organizations) are not entered, program will warn user that data entered is incomplete, and configuration will not be saved.

1.1.1.3 Activate meter

Once configured, meter is still not included in automatic reading plan. By selecting meter from the list and clicking on *Activate* button, meter becomes active, and therefore, part of automatic reading plan. Meters in status Parametrized cannot be activated. They do not have communication configuration associated, so they cannot be remotely accessed, and therefore cannot be considered as active.

1.1.1.4 Deactivate Meter

Click on *Deactivate meter* button deactivates selected active meter. Consequence of meter deactivation is removal of meter from active automatic reading plan. This can be done by selecting the meter from the grid, and clicking on this button. Selected meter must be in status *Activated*. After click on *Deactivate Meter*, warning message appears. After click on *Yes*, meter status becomes *Deactivated.* If *No* is clicked, nothing happens. If selected meter already is in status *Deactivated*, application will notify user that selected meter is already deactivated.

Deactivation **DOES NOT** delete meter from system.

1.1.2 PLC Net

This part of application is used for definition of PLC network for meter activation via indirect PLC network. Only one button exists in this group - *Overview*.

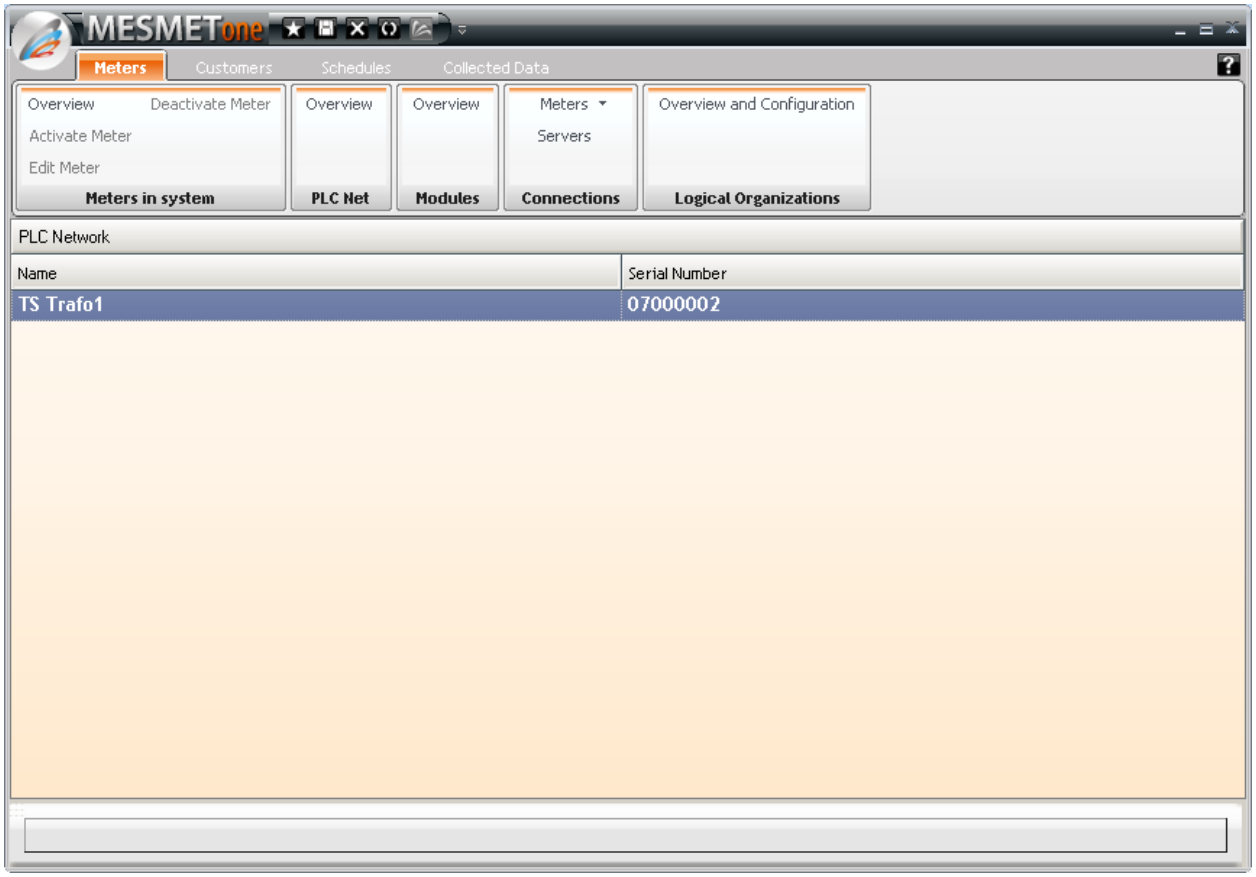


Fig. 1.9 PLC Net

1.1.2.1 Overview

After click on Overview button, form containing grid with list of all defined PLC networks is displayed (fig. 1.9). For each PLC network, name and concentrator serial number are shown. New PLC network is entered by clicking on *Add* button. New row appears in the list, and after entering name and PLC serial number, network data are saved by clicking on *Save* button. Changes on existing PLC networks are made in similar fashion, by editing data shown in grid and clicking on *Save* button.

Click on *Delete* button deletes selected PLC network from the system.

PLC networks defined here can be connected to meters used in PLC communications via *Edit meter*.

1.1.3 Modules

This part of application is used for adding new module into system, applying changes on existing modules, deleting, etc. These modules are used in meter activation.

1.1.3.1 Overview

After click on *Overview* button, list of all modules in system is shown (fig. 1.10).

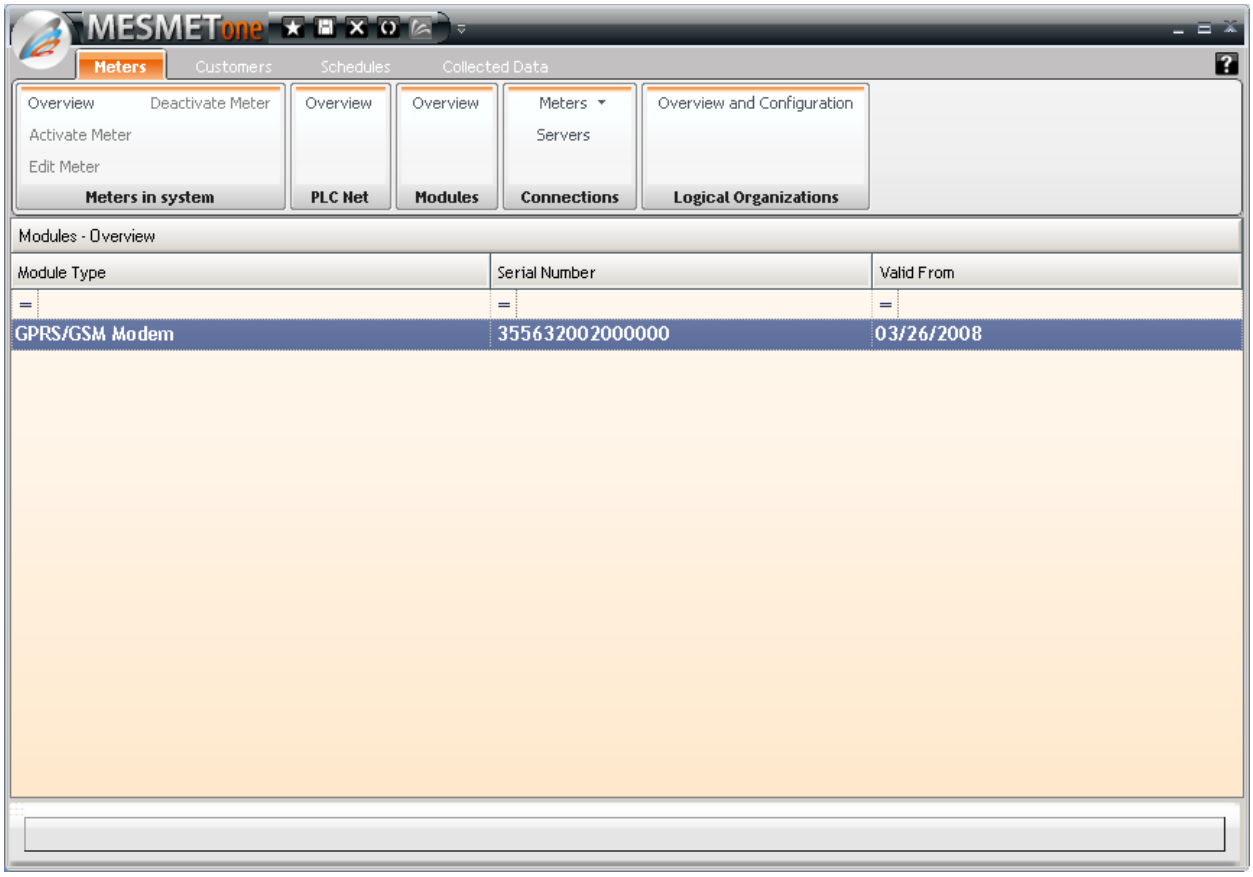


Fig. 1.10 Modules in system

This list contains columns *Module Type*, *Serial Number* and *Valid from*. For *Module Type* one of predefined module types can be chosen: *GPRS-GSM Modem, PLC Router, PLC Modem, Zigbee Coordinator, Zigbee Module, RS 485 Module, RS 232 Module, M-Bus Module, GSM Modem* and *GPRS Modem*.

This list has filter allowing filtering modules by each column. Data filtering is explained in previous paragraphs.

Available buttons from main menu are *Add*, *Save*, *Delete* and *Refresh*.

New module is added into system by clicking on *Add* button. After click on *Add*, new row is shown in list. Data *Module Type* and *Serial Number* must be entered manually, while *Valid from* field is filled automatically. *Module Type* is chosen from combo-box.

Module can be saved by clicking on *Save* button. Saved module can be assigned to meter via *Edit Meter*.

Module is deleted by click on *Delete* button. After click on *Delete*, warning message is displayed. If *Yes* is clicked, module is deleted. If module is already assigned to meter, it cannot be deleted, and appropriate message will be shown in status line.

Click on *Refresh* button refreshes displayed module list.

1.1.4 Connections

This part of application is used for defining server connections for meter access, and connections for meters. Meters can be accessed via direct (mobile) or indirect connection.

This part has two separate parts - *Meters* and *Servers*. Click on arrow pointing down shows drop-down menu with *Direct connections* and *Indirect connections*. In *Direct connections* it is possible to choose *Mobile* (fig. 1.11).

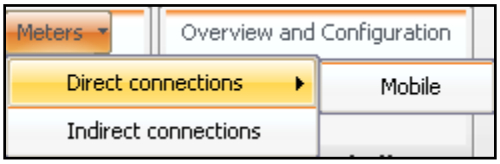


Fig. 1.11 Connections drop-down menu

1.1.4.1 Meters-Direct connections-Mobile

In upper half of this control (fig. 1.12) there is grid containing all connections and showing their names and statuses (*Parametrized*, *InActive* or *Active*). Lower half shows parameters of selected connection - *Name*, *Telephone and IP Address*.

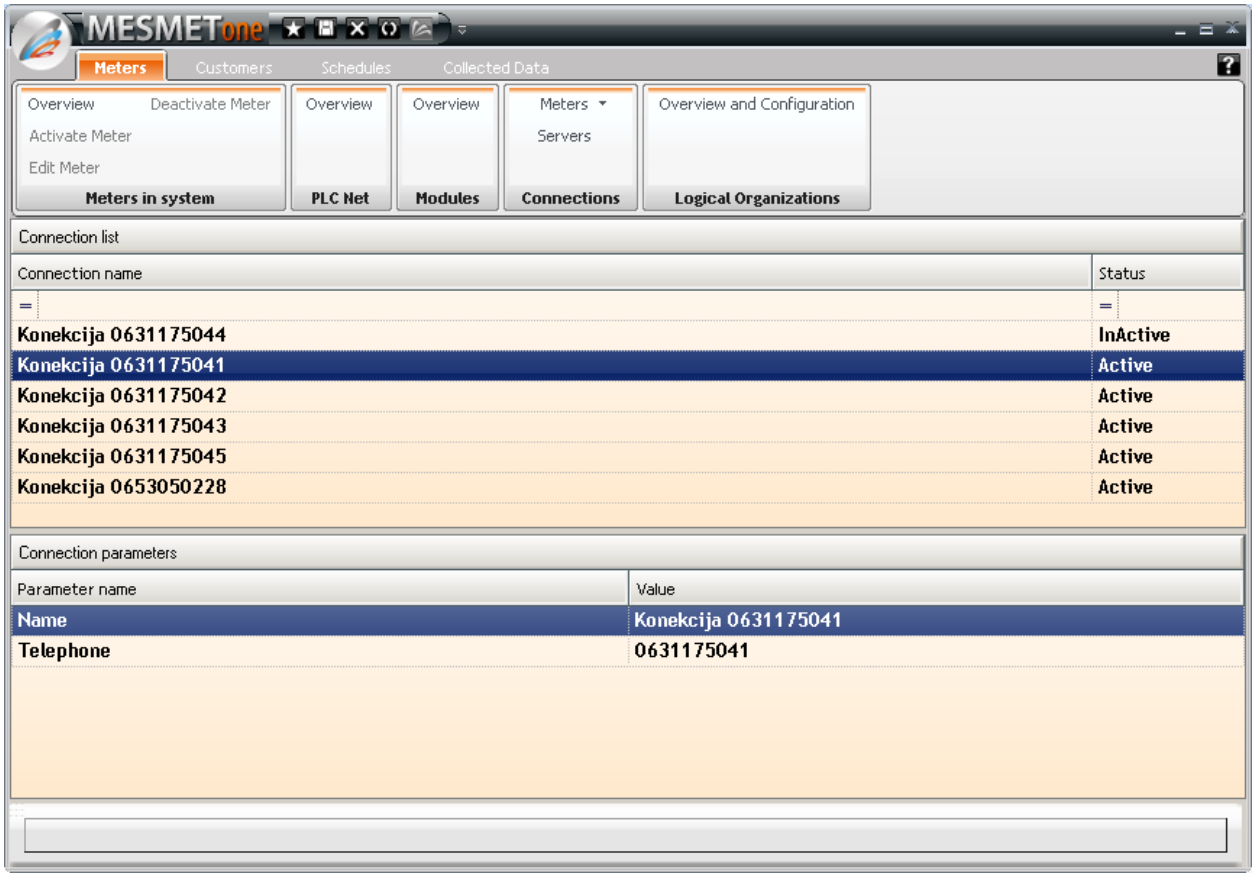


Fig. 1.12 Direct connections

Buttons available from main menu on this form are: *Add*, *Save*, *Delete* and *Refresh*.

Click on *Add* adds new row into upper table (*Connection List*). It is not possible to enter data into this row. It's done via table *Connection Parameters*, where name and phone number are entered.

After click on *Save*, connection data are saved into system. It is not possible to save two connections with same name (application will report an error to user).

Click on *Delete* removes selected connection.

Click on *Refresh* refreshes connection list and parameters.

1.1.4.2 Meters-Indirect connections

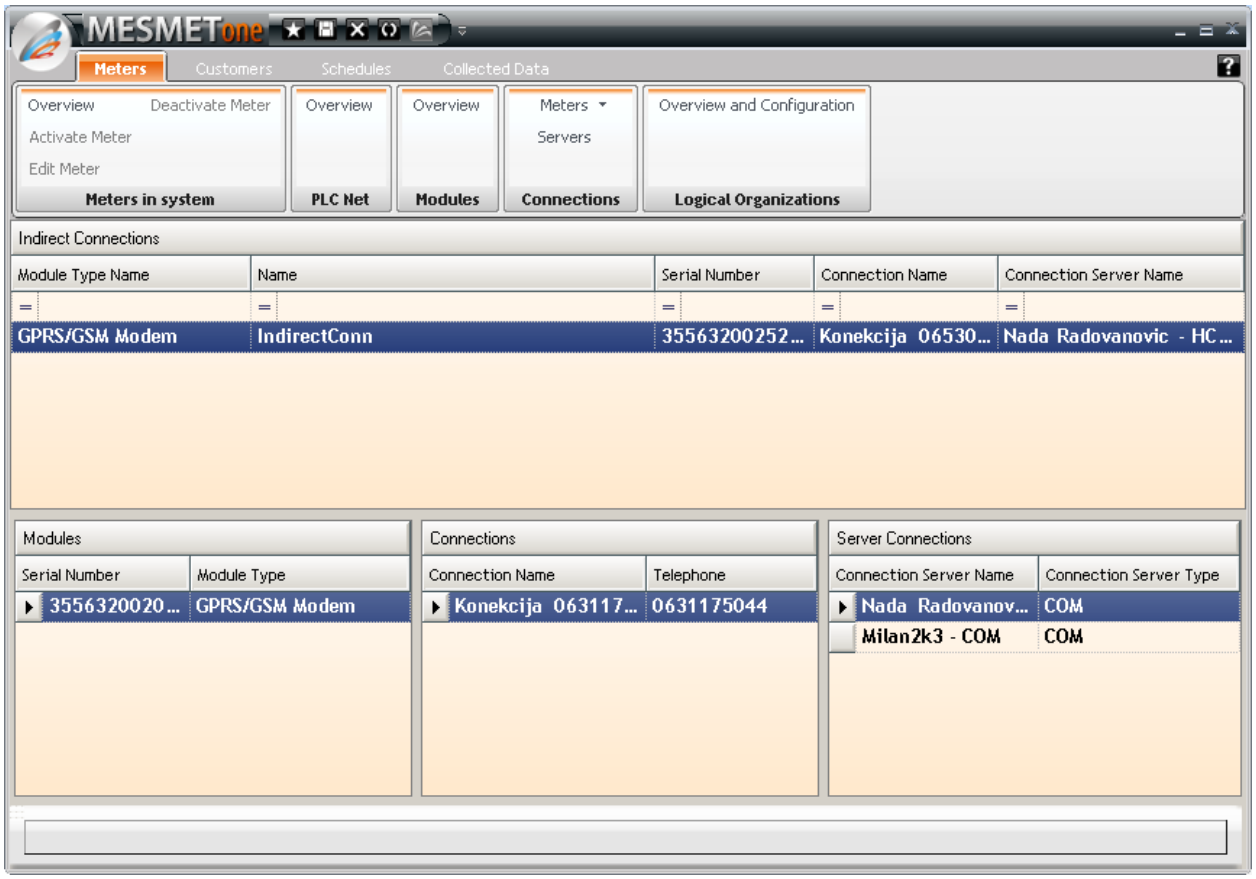


Fig. 1.13 Indirect connections

Upper half of this control (fig. 1.13) contains list of existing indirect connections, and lower displays available modules, direct and server connections. For each indirect connection, its module type, name, serial number, direct connection name and server connection name are shown.

Buttons available from main menu on this form are: *Add*, *Save*, *Delete*, *Refresh*.

Click on *Add* adds new row into *Indirect Connections* table. Only *Name* is entered directly into new row, other columns take values from selection from module, direct and server connection tables. Types of selected server connection and module must be compatible.

Click on *Save* saves newly added connection and any other changes into system. It is not possible to save two connections with same name (application will report an error to user).

Click on *Refresh* refreshes connection list and parameters.

1.1.4.3 Servers

This control contains two tabs– COM connections and GPRS connections (fig. 1.14).

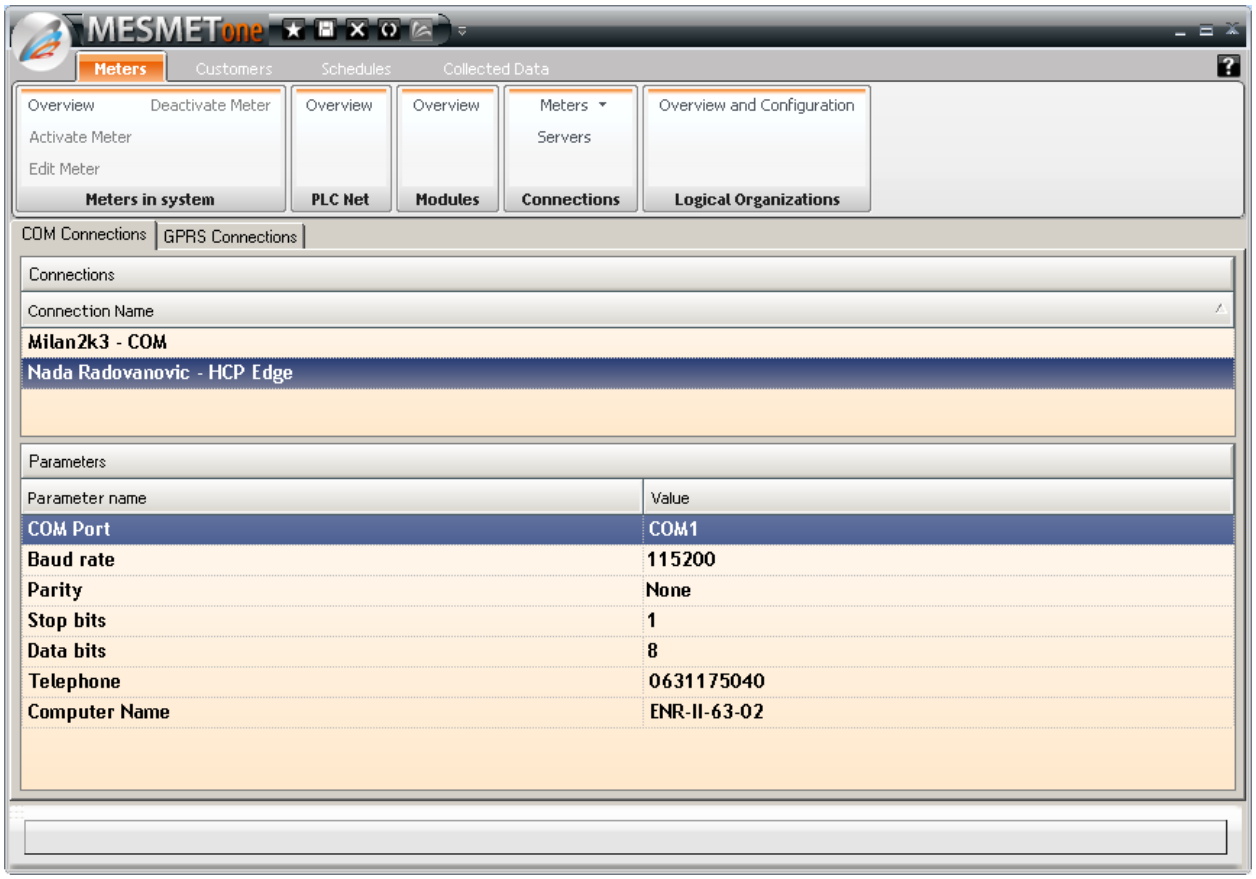


Fig. 1.14 Server connections

Upper half contains list of existing server connections in system (*Connections*), with one column – (*Connection Name*). Lower half contains grid with parameters of selected connection.

Buttons available from main menu on this form are: *Add*, *Save*, *Delete*, *Refresh*.

Click on *Add* adds new row into *Connections* table. Connection name is entered into *Connection Name* column. In *Parameters* table all parameters (*Com Port, Baud Rate, Parity, Stop bits, Data bits, Telephone, Computer Name*) values should be set to appropriate values. Some parameters' values are entered manually, while some have predefined values in combo-boxes.

Click on *Save* saves newly created server connection in system. It is not possible to save two connections with same name (application will report an error to user).

Click on *Refresh* refreshes connection list and parameters.

1.1.5 Logical Organizations

Electricity meters in the system are can be grouped by the types of Organization Units. Because of that, firstly types of Organization Units are defined, and then, the units of defined type. These units can be defined in multi level in the parent/child relationship. Organization units make possible easier searching, grouping and manipulation on Electricity meters.

1.1.5.1 Overview and Configuration

After clicking on *Overview and Configuration* the form with the list of organization units appears on the left as a tree (Fig. 1.15)

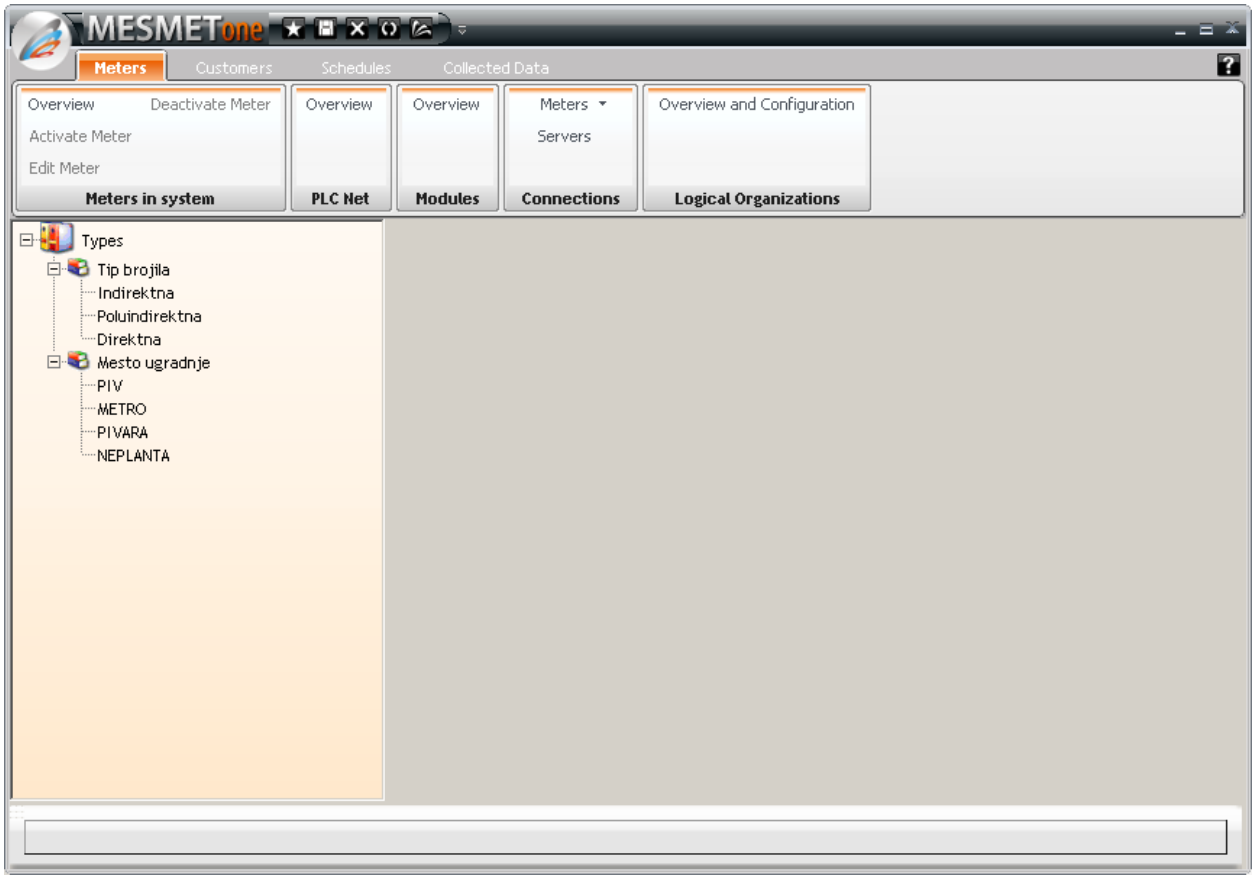


Fig. 1.15 Organization Units

If there is still no organization types defined, and by that no organization units, this tree has only one element: *Types* (not the case with Fig. 1.15). Clicking on this element with the left mouse button, the right part of this form appears (Fig. 1.16). In

this newly opened part of the form there is a table with the name: *Type of logical organization*. In the column *Name* the organization type name is inserted, and value in the *Required* column is checked if the organization type is required or not for inserting electricity meter in the system. Buttons of the main menu (*Add, Save, Delete, Refresh*) are available and are used for manipulating Organizational structure.

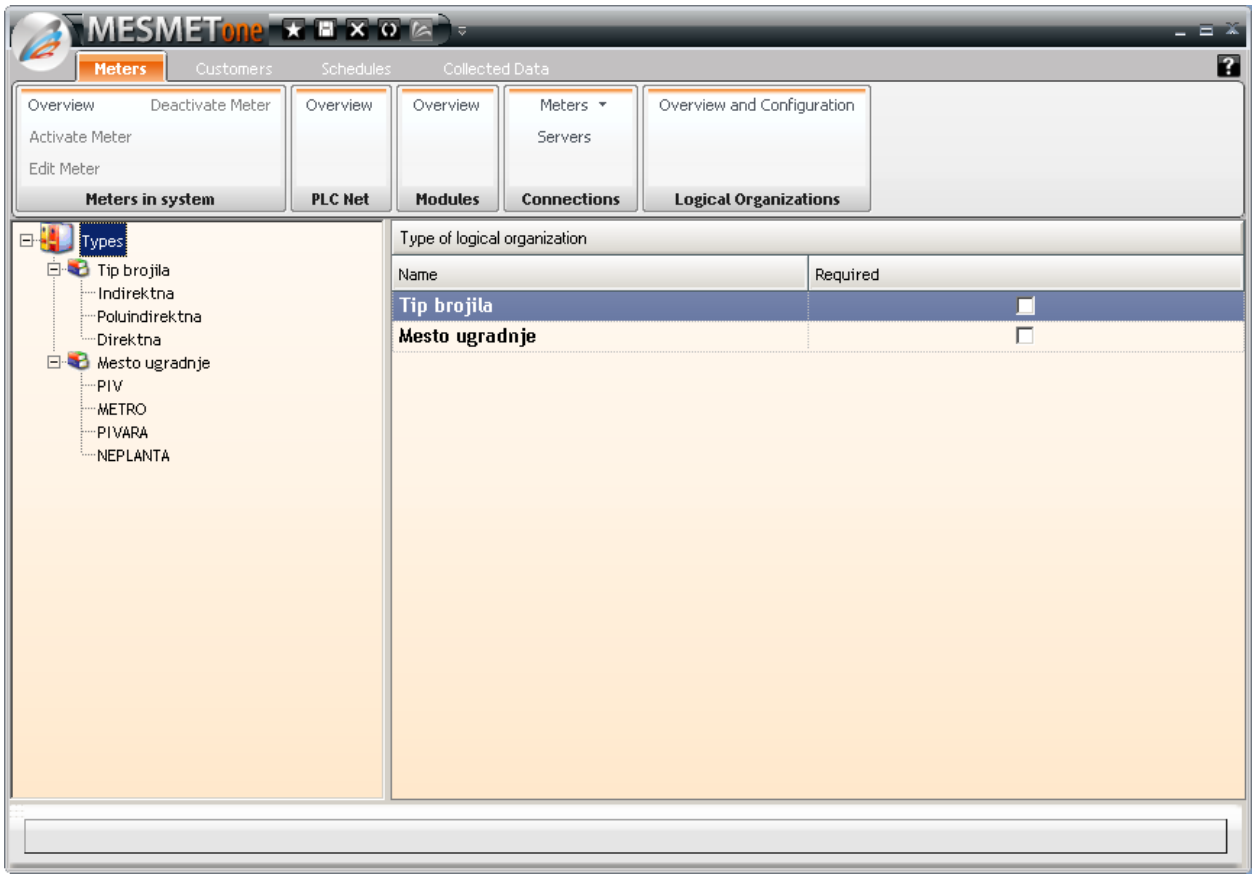


Fig. 1.16 The table of Organization Types

By clicking on the button *Add* the new row in the table *Type of logical organization* is added. After updating columns of the new row, the newly defined Organization Type is saved in the system by clicking on the *Save* button. If the Save operation is successfully completed, the user is informed in status line of the application, and this new Organization Type is displayed in the tree (in the level below *Types*). If this new Organization Type is required, the color on the tree of this node is red. The rows in the table *Type of logical organization* can be deleted by clicking on the *Delete* button. Click on *Refresh* refreshes on-screen data.

Adding new organization units of the specified type is done by selecting organization type, and then, clicking on the button Add of the main menu. After

updating the name of this new node which represents the organization unit of the selected organization type, clicking on Save causes saving updated data.

After left mouse click on any organization unit, list with all meters in the selected organization unit is shown on the right side of the form (Fig. 1.17).

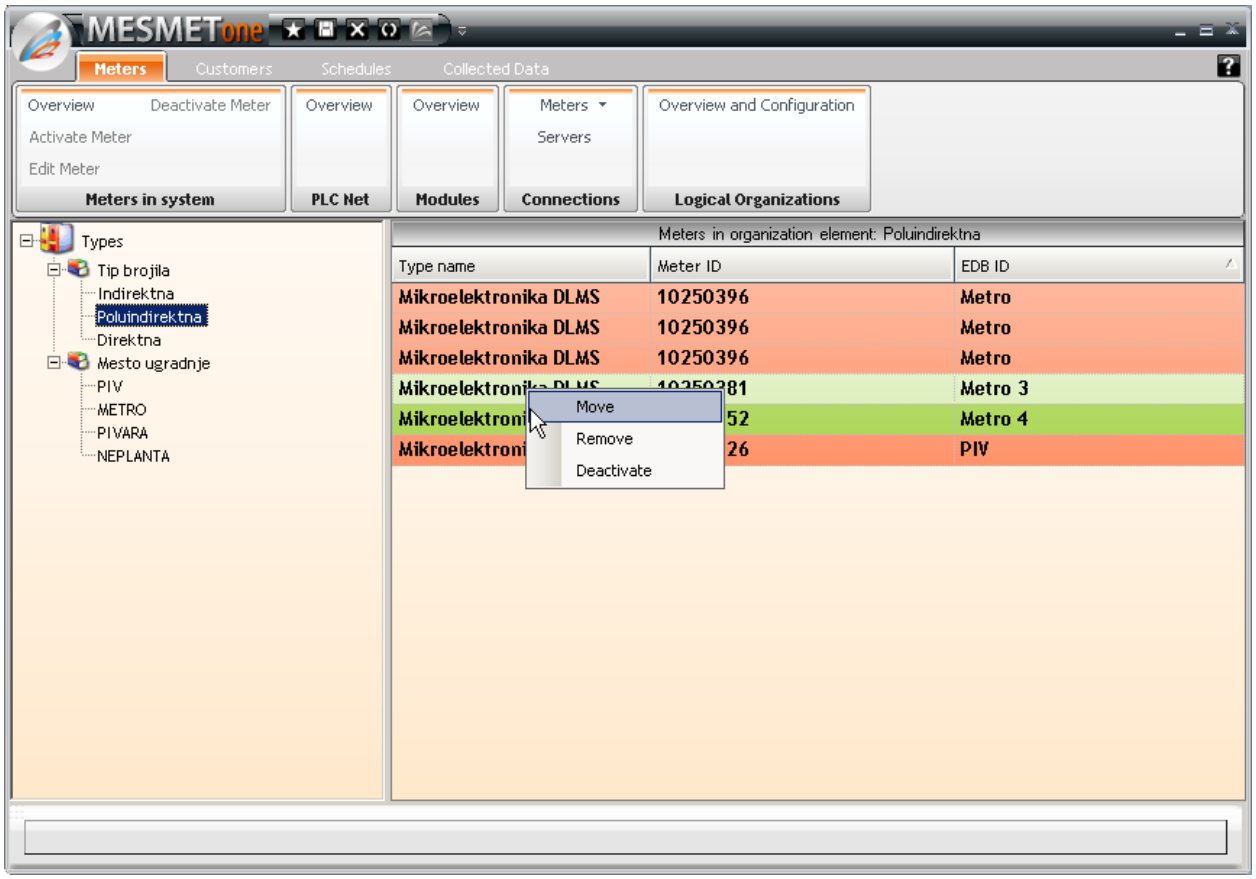


Fig. 1.17 Meters in selected organization unit

For every meter in the table it is shown his type (*Type name*), *Meter ID* and *EDB ID*. Active meters (included in automatic readings) are colored green, and the not active ones are red. After right mouse button click on meter, context menu with options *Move*, *Remove* and *Deactivate* appears. Availability of these options depends on the status in which the meter is or on the *required* attribute of the organization type in which the selected organization unit is. Already *inactive* meter cannot be deactivated or moving and removing meters cannot be done from the obligatory organization type. Selecting the option *Move* from this Context Menu, the right part lets the user to choose the new organization element in which to put selected meter. (Fig. 1.18)

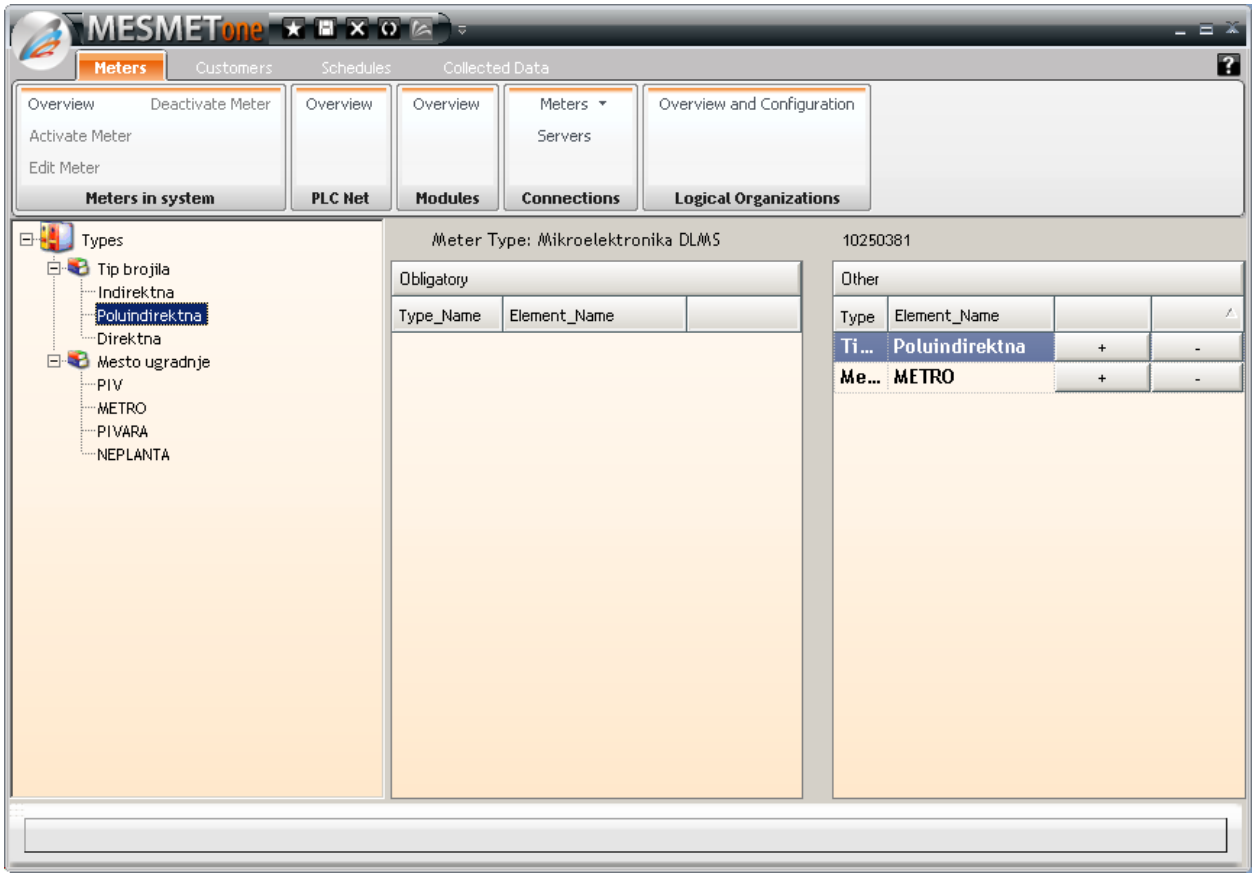


Fig. 1.18 Moving meter 10250381 from one organization unit to another

In these tables obligatory and not obligatory organization units in which the selected meter can be moved. Handling this control is the same as with the control for activating meters explained before.

Options *Remove* and *Deactivate* are used for removing and deactivating the selected meter from the table.

Deleting the organization unit is done by selecting the element from the tree, and then, by clicking on the *Delete* button from the main menu. If in the selected organization unit exists some electricity meters, the system will notify the user that the selected node cannot be deleted because there are meters in it.

1.2 Customers

This part of the program contains only the group *Customers*.

1.2.1 Customers

After click on the Customers button, the table for viewing the customers appears. (Fig. 2.1)

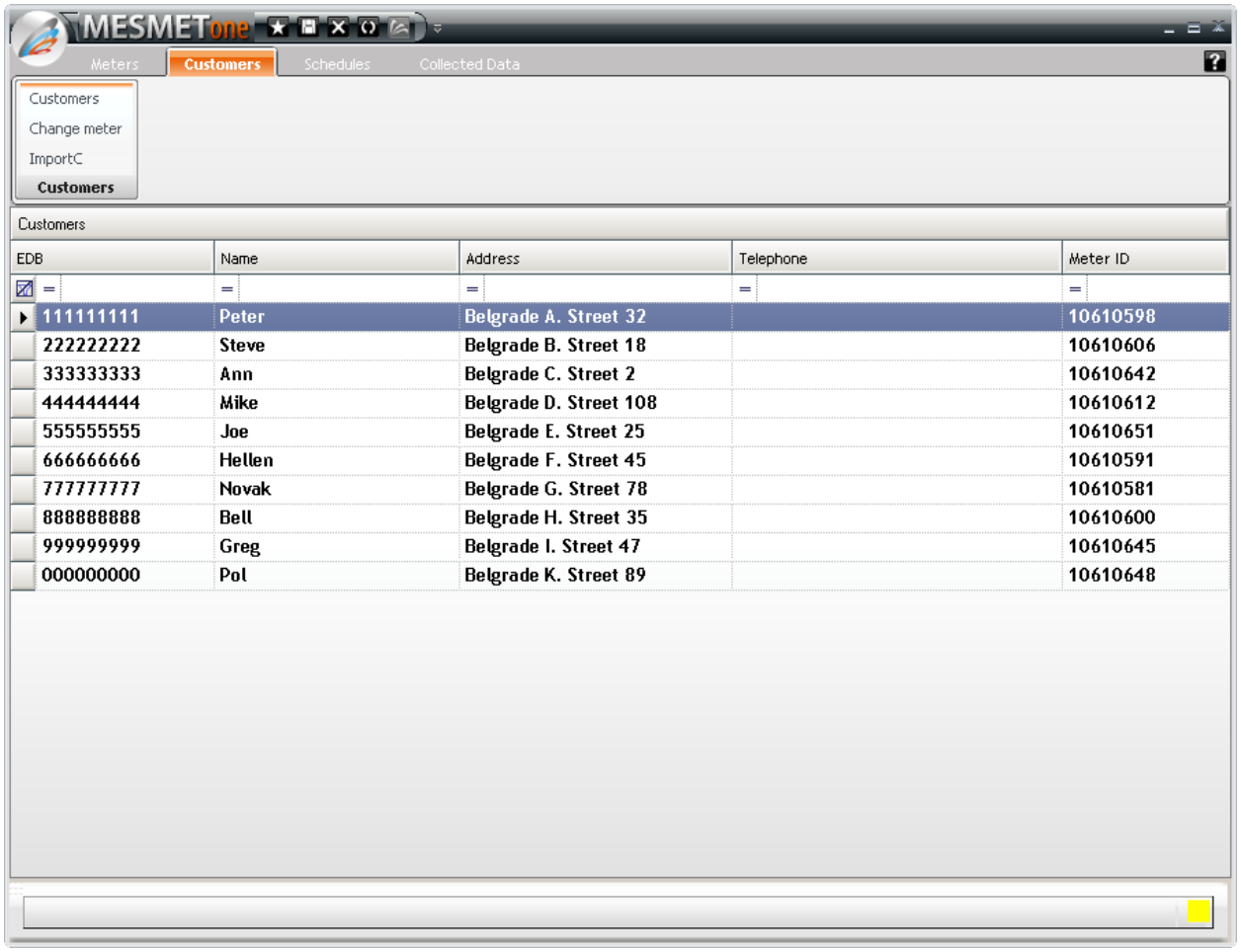


Fig. 2.1 – Customers overview

In this table, current customers data can be overviewed, new customers can be added or old customers deleted, and it is also possible to change the electricity meter which is attached to the customer.

The new customer can be added by clicking on the *Add* button of the main menu. After click on the *Add* button, new empty row is added into grid. This row needs to be filled with all necessary data and by clicking on button *Save* of the main menu this

changes are saved in the system. If all necessary data is not inserted, the application will notify the user with the error message.

Deleting of the customer is done by selecting the customer to delete, and clicking on the *Delete* button from the main menu.

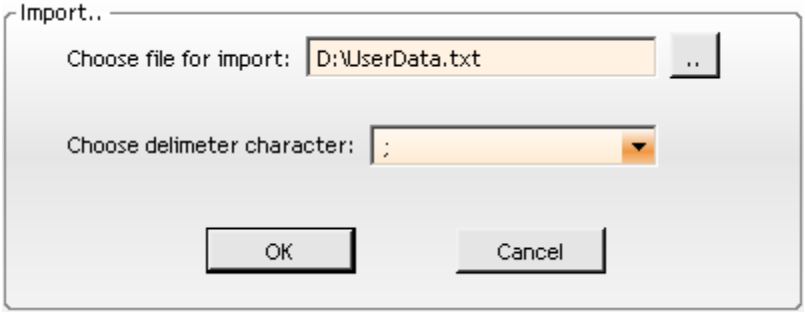
1.2.2 Change meter

Changing meter is done by selecting the customer whose meter should be changed, and then, clicking on the button *Change meter*. After this step, the list of all available configured electricity meters appears. From this list the user chooses the meter which he wants to attach to the selected customer instead of the current meter.

Changing of the meter for the customer is allowed only if meter selected as substitute is in status *Configured*. Also, it is not possible to do the change if the customer has no meter attached.

1.2.3 Import customers

Customers' data can be imported from text file. Text file must be in appropriate format – with four columns ('EDB', 'Name', 'Address', 'Telephone'), and data separated with appropriate delimeter character.Delimiter character can be chosen from combo box. Predefined values are ; , and TAB, but it is possible to enter any delimeter.



Appropriate text file can easily be generated from Microsoft Excel table.

1.3 Schedules

In this part of the application all the parameters that have any kind of relationship with the automatic reading can be set. First of all, definition of the schedule by which the system will do the automatic reading of meters, then the collection of meters to be read by selected schedule, and finally the data to be read from selected collection of meters.

There are three groups in this part of the application: *Schedules, Logical Organization Filtering* and *Readouts*.

1.3.1 Schedules

This group is related with defining schedules in the system. It contains only one button: *Overview and Settings*.

1.3.1.1 Overview and Settings

After click on this button, the control with two tabs appears. These tabs are *Daily and Monthly* (Fig. 3.1).

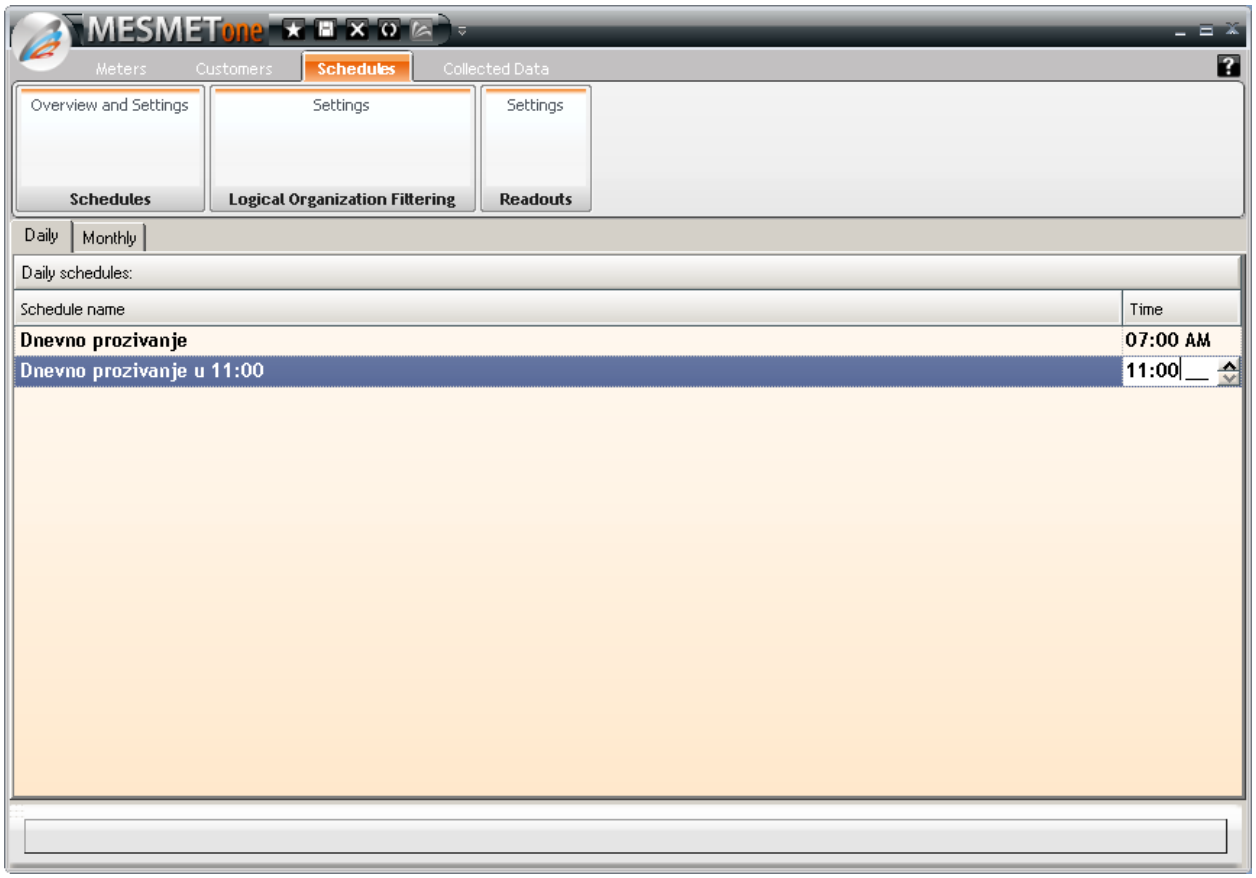


Fig. 3.1 Schedule administration

The *Daily* tab contains the table *Daily Schedule* with columns *Schedule name* (the name of the schedule) and *Time* (the everyday execution time of the schedule).

Available buttons of the main menu are: *Add, Save, Delete* and *Refresh.*

Adding the new schedule is done by clicking on the *Add* button which adds one new row in the table. After setting the name and the time of execution, click on the *Save* button saves this changes in the system. It means that from that moment, every day in the future, this schedule will try to execute something in the specified time. Deleting of the schedule is done by selecting the schedule to be deleted, and clicking on the button Delete. For refreshing the table with the current data in the database, user must click on the *Refresh* button.

The *Monthly* tab contains the same table, but for defining monthly schedules. This means that the schedule defined on this tab will execute at specified day of month (the field *Day in Month*) at midnight.

1.3.2 Logical Organization Filtering

In this part of the application, the filters on organization units representing the set of meters to be read are defined. This way it is possible to automatically read only predefined sets of meters instead of all of them.

1.3.2.1 Settings

After click on this button, the control with three lists appears. (Fig. 3.2)

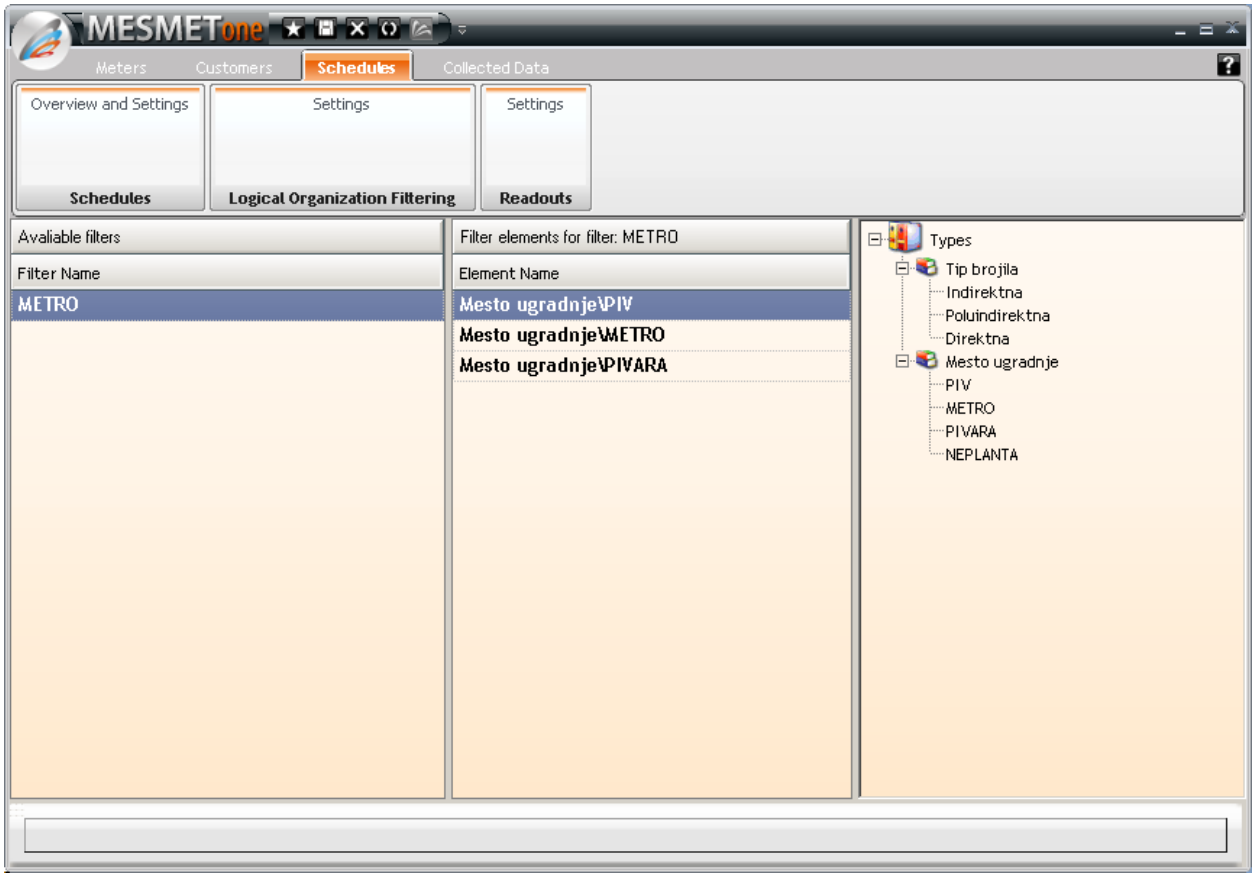


Fig. 3.2 Organization units filter administration

In the first list – *Available filters* - all available, already defined, filters are shown. In the list in the middle – *Filter elements for filter* –the details for selected filter in *Available filters* are given. This list contains all organization units assigned to the selected filter. On the right is the tree of the defined organizational structure.

Available buttons for this control are *Add, Save, Delete* and *Refresh.*

Creating the new filter is done by clicking on the button Add. After this step, new row in the *Available filters* table is added. User must enter the name of the new filter. The next step is adding organizational units in this new filter. Double mouse click on any of organizational units from the tree on the right puts it in the list on the middle. Similarly, double click on any already assigned element in the middle list removes this element from the list. After administrating this new filter, user must click on the button Save which saves all the changes that user made. Deleting filter is done by selecting the filter from the Available filters list, and then clicking on the button Delete. Button Refresh shows the data currently in the system for this form.

1.3.3 Readouts

In this part of the application reading object settings is done. Reading settings assume defining the data that is to be read from defined meters on defined schedule. Meters are defined using organizational units filtering, and schedules are explained earlier in this text. There is only one button – *Settings*.

1.3.3.1 Settings

After click on the *Settings* button, the control for readouts defining appears. (Fig. 3.3)

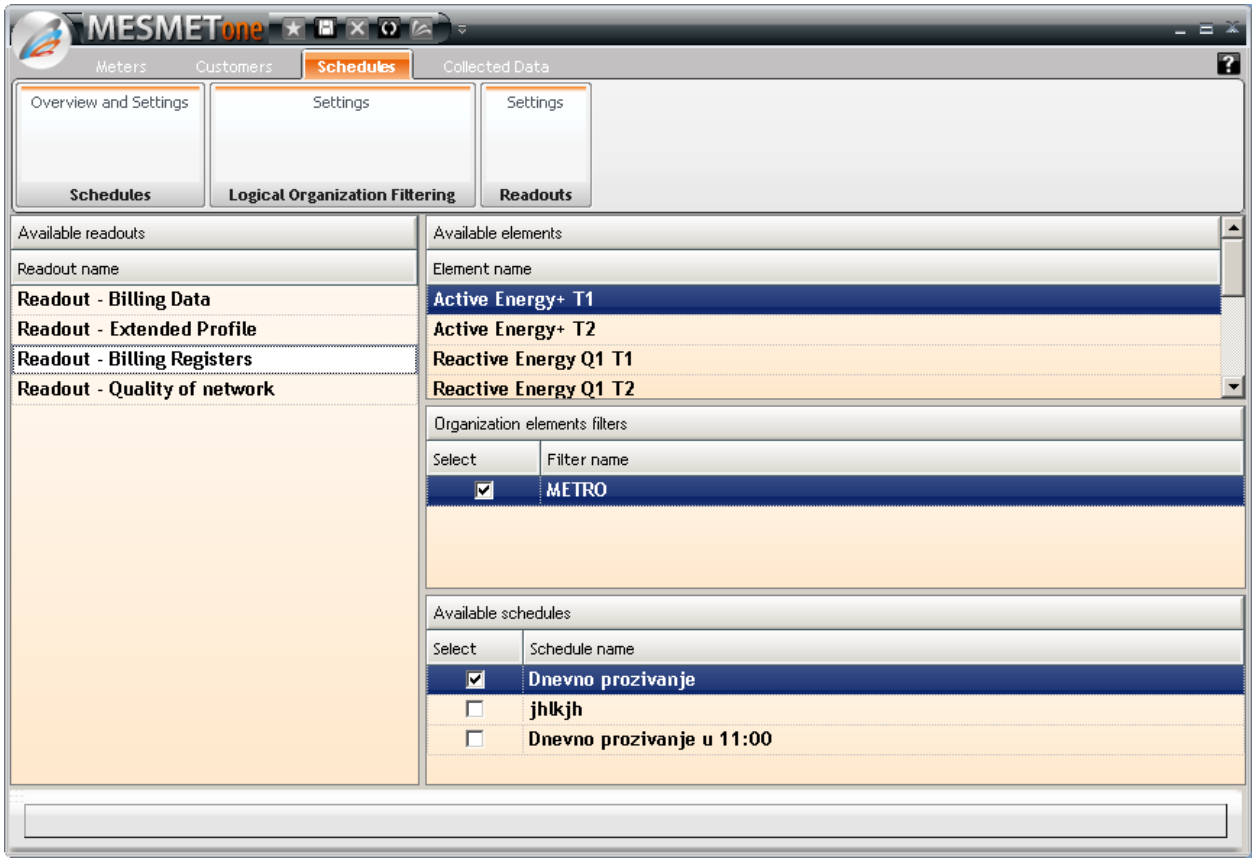


Fig. 3.3 Readouts administration

The list on the left – *Available readouts* – contains all manufacturer predefined sets (Readouts) of data which can be read from the electricity meter. Details for any Readout in the list on the left are shown in the three lists on the right.

The first list of the three, named *Available elements*, contains all the data that will be read from meter with selected Readout. The list below, named *Organization elements filters*, contains all the organization units filters which are defined in the previous section. Filter which are checked represent the union of all electricity meters in

those filters that will be read with selected Readout. In the last list, named *Available schedules*, the user can choose which schedule will be applied to the selected Readout.

Available buttons of the main menu for this control are: *Save* and *Refresh*.

The button Save saves all the changes that user made on the selected Readout.

The button Refresh returns the current data from the database for this control.

1.4 Collected data

This part of application enables user to view and export data read from the meters saved in filter. It consists from few groups: *24h Tasks List, Meter Filtering, PocketPC* and *Communication Results*.

1.4.1 24h Task List

This part of application enables overview of all tasks from the database, with their statuses. It has three buttons: *Overview, Cancel unfinished tasks* and *View logs* (fig. 4.1).

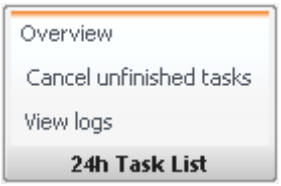


Fig. 4.1: 24h Task List buttons

1.4.1.1 Overview

After click on this button, *24h Task List* is displayed on the form (fig. 4.2).

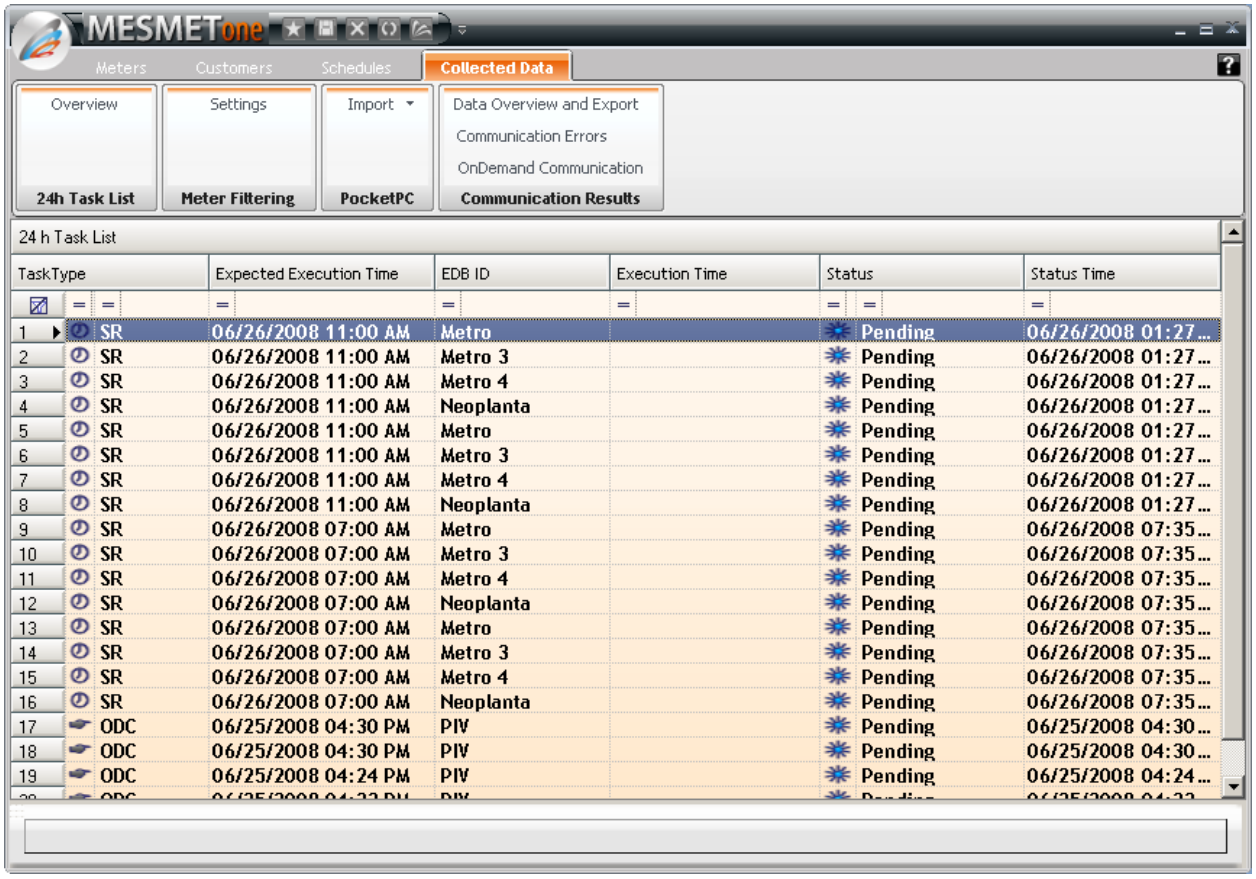

MESMETone
Meters
Customers
Schedules
Collected Data
Overview
Settings
Import
Data Overview and Export
Communication Errors
OnDemand Communication
24h Task List
Meter Filtering
PocketPC
Communication Results
24 h Task List
TaskType
Expected Execution Time
EDB ID
Execution Time
Status
Status Time
1 SR 06/26/2008 11:00 AM Metro Pending 06/26/2008 01:27...
2 SR 06/26/2008 11:00 AM Metro 3 Pending 06/26/2008 01:27...
3 SR 06/26/2008 11:00 AM Metro 4 Pending 06/26/2008 01:27...
4 SR 06/26/2008 11:00 AM Neoplanta Pending 06/26/2008 01:27...
5 SR 06/26/2008 11:00 AM Metro Pending 06/26/2008 01:27...
6 SR 06/26/2008 11:00 AM Metro 3 Pending 06/26/2008 01:27...
7 SR 06/26/2008 11:00 AM Metro 4 Pending 06/26/2008 01:27...
8 SR 06/26/2008 11:00 AM Neoplanta Pending 06/26/2008 01:27...
9 SR 06/26/2008 07:00 AM Metro Pending 06/26/2008 07:35...
10 SR 06/26/2008 07:00 AM Metro 3 Pending 06/26/2008 07:35...
11 SR 06/26/2008 07:00 AM Metro 4 Pending 06/26/2008 07:35...
12 SR 06/26/2008 07:00 AM Neoplanta Pending 06/26/2008 07:35...
13 SR 06/26/2008 07:00 AM Metro Pending 06/26/2008 07:35...
14 SR 06/26/2008 07:00 AM Metro 3 Pending 06/26/2008 07:35...
15 SR 06/26/2008 07:00 AM Metro 4 Pending 06/26/2008 07:35...
16 SR 06/26/2008 07:00 AM Neoplanta Pending 06/26/2008 07:35...
17 ODC 06/25/2008 04:30 PM PIV Pending 06/25/2008 04:30...
18 ODC 06/25/2008 04:30 PM PIV Pending 06/25/2008 04:30...
19 ODC 06/25/2008 04:24 PM PIV Pending 06/25/2008 04:24...

Fig. 4.2 24h task list

This list shows all tasks in the system happened in the last 24h. For each task in this list its task type is shown, as well as expected execution time, EDB ID, Execution Time, Status and Status Time. Tasks can be in one of following statuses: Pending, Canceled, Completed Successfully and Completed with errors. Task type can be SR or ODC. SR type means that task is developed from the reading schedule, and ODC type means task is developed from on demand command.

It's worth noticing that this list is used for reviewing only; no actions are available. Because of that, main menu buttons aren't available when this list is loaded.

This list also can be filtered. Filters (explained earlier) enable this operation. This way, it is possible e.g. to show only tasks executed with errors (status Completed with Errors) etc.

1.4.1.2 Cancel unfinished tasks

If some unwanted tasks are ordered (e.g. attempt to read meters via unavailable connection), it is possible to cancel them by clicking on *Cancel unfinished tasks* button and confirming the action. After that, all pending or delayed tasks will be cancelled.

1.4.1.3 View logs

All system errors and communication problems data are preserved in the database, and can be viewed by clicking on *View logs* button (fig 4.3).

LogText	TimeStamp	TypeName
ID Measurement Device: 407	17-02-09 12:08 PM	Measurement Device Successfully Read
Polled (BUSY): 0647043084	17-02-09 12:09 PM	ModemPolled (BUSY)
Polled (BUSY): 0647043084	17-02-09 12:10 PM	ModemPolled (BUSY)
SIM number 0647043084 / NO CARRIER No r...	17-02-09 12:12 PM	ModemPolling failure
SIM number 0647043084 / NO CARRIER No r...	17-02-09 12:12 PM	ModemPolling failure
Polled (BUSY): 0647043084	17-02-09 12:13 PM	ModemPolled (BUSY)
SIM number 0647043074 / NO CARRIER No r...	17-02-09 12:14 PM	ModemPolling failure
SIM number 0647043074 / NO CARRIER No r...	17-02-09 12:14 PM	ModemPolling failure
SIM number 0647043074 / NO CARRIER No r...	17-02-09 12:15 PM	ModemPolling failure
Polled (BUSY): 0647043084	17-02-09 12:15 PM	ModemPolled (BUSY)
Connection Broken! 172.30.218.54:1024 / l...	17-02-09 12:16 PM	Measurement Device Read failure
pred upis komandaUpdate za Task 159662	17-02-09 12:16 PM	StatusUpdateForTask, errorFlag=1
ID Measurement Device: 407	17-02-09 12:16 PM	Measurement Device Successfully Read
172.30.218.184, socket not connected / cl...	17-02-09 12:17 PM	Socket not connected to remote EndPoint
Polled (BUSY): 0647043084	17-02-09 12:20 PM	ModemPolled (BUSY)
pred upis komandaUpdate za Task 159663	17-02-09 12:22 PM	StatusUpdateForTask, errorFlag=1
ID Measurement Device: 407	17-02-09 12:22 PM	Measurement Device Successfully Read
Polled (BUSY): 0647043084	17-02-09 12:22 PM	ModemPolled (BUSY)
SIM number 0647043074 / NO CARRIER No r...	17-02-09 12:24 PM	ModemPolling failure
SIM number 0647043074 / NO CARRIER No r...	17-02-09 12:24 PM	ModemPolling failure
SIM number 0647043074 / NO CARRIER No r...	17-02-09 12:25 PM	ModemPolling failure

Fig. 4.3: Logs

1.4.2 Meter Filtering

This part of application is used to define filters, which consist from meters, for which user wants to review readouts, see communication errors, or to let on demand command on this meters.

This part of application contains one button - *Settings*.

1.4.2.1 Settings

After click on this button, control that consists from 5 parts is shown (fig. 4.4).

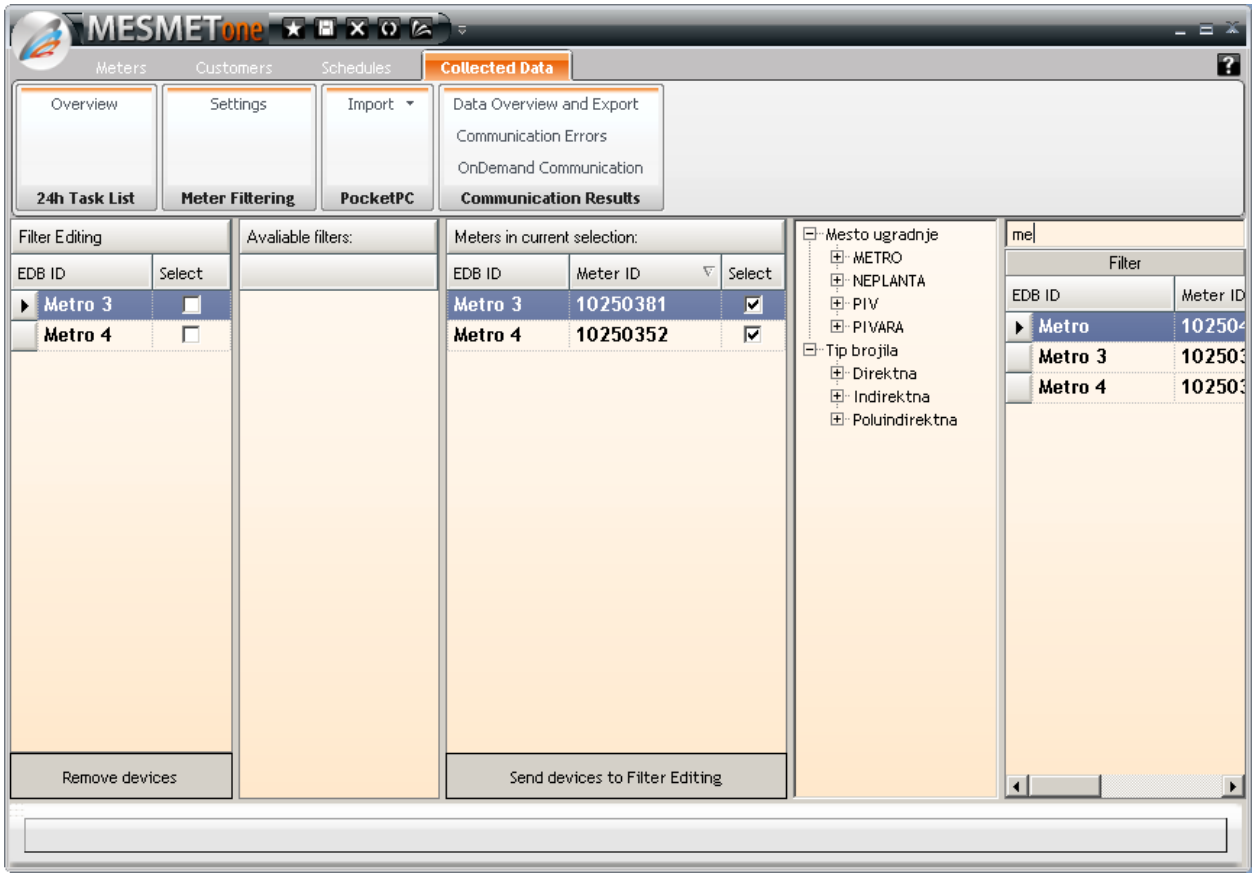


Fig. 4.4 Device filtering

List from the left side is named *Filter editing* and consists of columns *EDB ID* and *Select*. It contains meters that define filter. List *Avaliable filter* consists of all previously defined and saved filters. Next to this list, there is another list named *Meters in current selection.* It consists of meters with their *Meter ID* and *EDB ID*, and it's filled with meters belonging to selected filter (from the list *Avaliable filters*). In fourth part, there is tree view of all defined logical organization. After click on an element from the tree, in the *Meters in current selection* list all meters belonging to selected organization element appear. On the right end side, there is a text box where user can enter meter's EDB ID which wants to find. Afterwards, if meter with entered *EDB ID* exists, it will appear in the list below, with its *Meter ID*, *EDB ID*, *Modem ID* and *Measurement Type*. After double click on row in this table, meter will be added to the *Filter Editing* list

Meters that user wants to save in new filter, or which are needed to be part of activated filter, have to be added to the *Filter Editing* list. This can be done on several ways. Click on the button *Send Devices To Filter Editing* sends checked meters from filter *Meters in current selection* and after that meters will be moved to the *Filter Editing* list. Meters can be removed from the *Filter Editing* list by checking them and clicking on the button in the bottom of the form, named *Remove Devices*.

Buttons from the main menu available on this control are: *Add*, *Save*, *Delete*, *Refresh* and *Activate.* After click on *Add* new row will be added into the list *Avaliable filters*. It is obligatory to insert name for new filter.

Click on *Save* button saves newly created row and all changes. Before clicking on *Save* button, it is necessary to move meters to the *Filter Editing* list. Otherwise, application will display an error.

After click on the *Delete* button, filter selected in the *Avaliable filters* list will be deleted.

Click on *Refresh* button refreshes on-screen data.

Click on Activate (from the main menu) activates filter with meters from *Filter Editing* list. *O*ther controls (will be described later) depend on filter data.

1.4.3 Pocket PC

This part of application enables communication with Pocket PC device, imports data that are read with Pocket PC from file stored locally or directly from Pocket PC.

It consists of two parts: *Import from file* and *Import from PPC*.

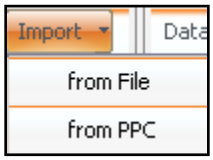


Fig. 4.5 Import data from PPC

1.4.3.1 Import from File

After click on this button, file browsing window appears. After selecting file stored on the local computer with the data from Pocket PC copied from PocketPC to computer, new control will be displayed (fig. 4.6).

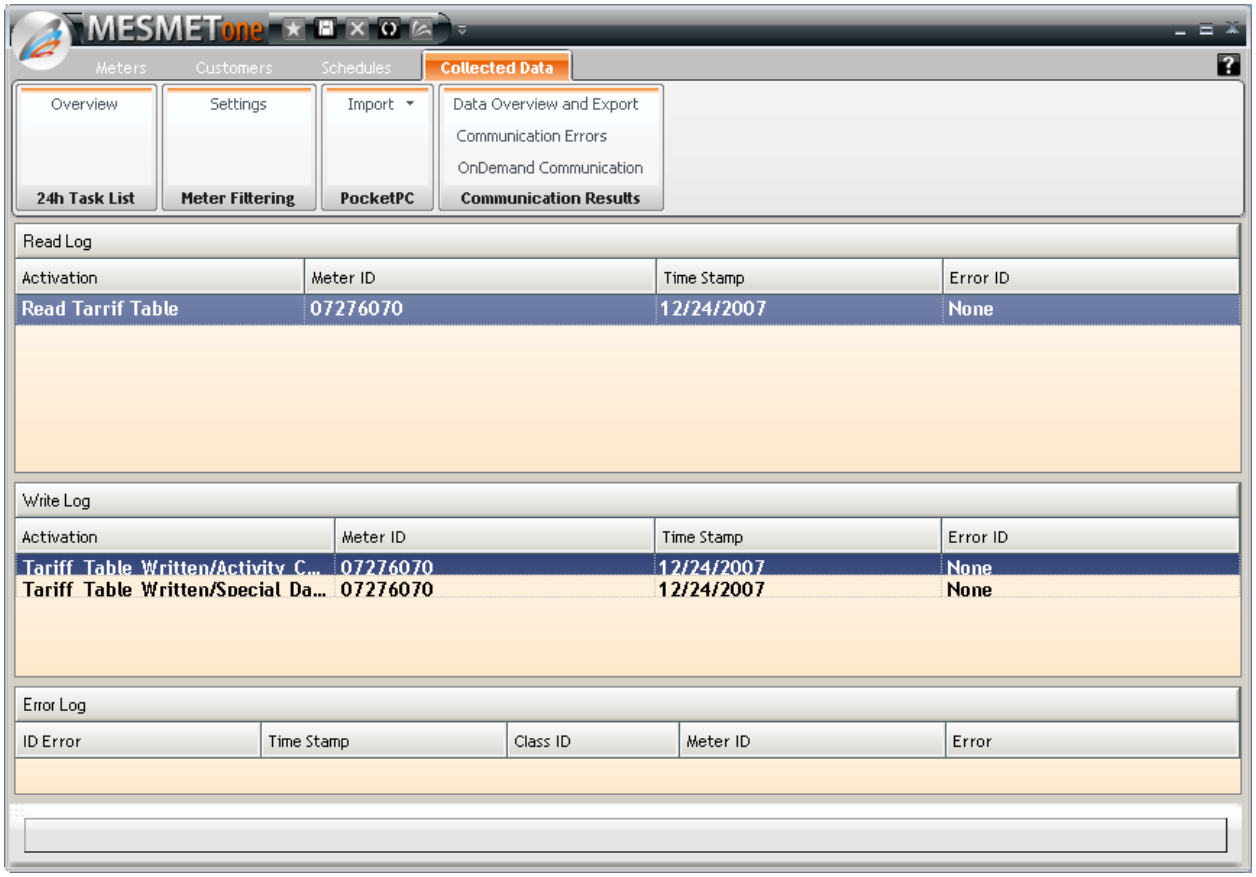


Fig. 4.6 Import data from file

In the top part of the form, there is list named *Read Log* that consists of four columns: *Activation, Meter ID, Time Stamp* and *Error ID*. In the middle part of this control there is *Write log* grid with columns *Activation, Meter ID, Time Stamp* and *Error ID*. Last, bottom part of form consists of only one list named *Error Log* and consists of columns: *ID Error, Time Stamp, Class ID, Meter ID and Error*.

Buttons from the main menu available on this control are *Save* and *Refresh*. After click on *Save,* data shown in this list is saved. Button *Refresh* refreshes on-screen data.

1.4.3.2 Import from PPC

Before clicking on this button, active connection to Pocket PC is needed.

After click on *Import from PPC,* new control, which consists of two parts, is shown. On the top of the form there is list named *Read Log* consists of four columns: *Activation, Meter ID, Time Stamp* and *Error ID*. In the middle of this control there is list *Write log* with columns *Activation, Meter ID, Time Stamp* and *Error ID*. Last, bottom

part of control consists of list named *Error Log* that consists of columns: *ID Error, Time Stamp, Class ID, Meter ID* and *Error*.

Buttons from the main menu available on this control are *Save* and *Refresh*. After click on *Save,* data shown in this list is saved. Button *Refresh* refreshes on-screen data.

1.4.4 Communication results

This part of application enables overview of all communication results, data read, communication errors and results of OnDemand commands execution.

1.4.4.1 Data Overview and Export

On this control, it is needed to insert time period into fields *From* and *To*, to determine time window from which user wants to view data. On left side of this control there is list of meters belonging to the activated filter (filter activation is described earlier). For each meter its EDB ID is shown (fig. 4.7). It is necessary to check all meters whose data is meant to be displayed. In the bottom left list there are identifiers of objects with their OBIS and EDIS code, from selected meter. It is necessary to select only objects whose values are wanted to be displayed. If only one meter is checked in the top left list, it is possible to check one or more objects from the bottom list for overview. If only one object is checked, it is possible to check more than one meter and to compare their data.

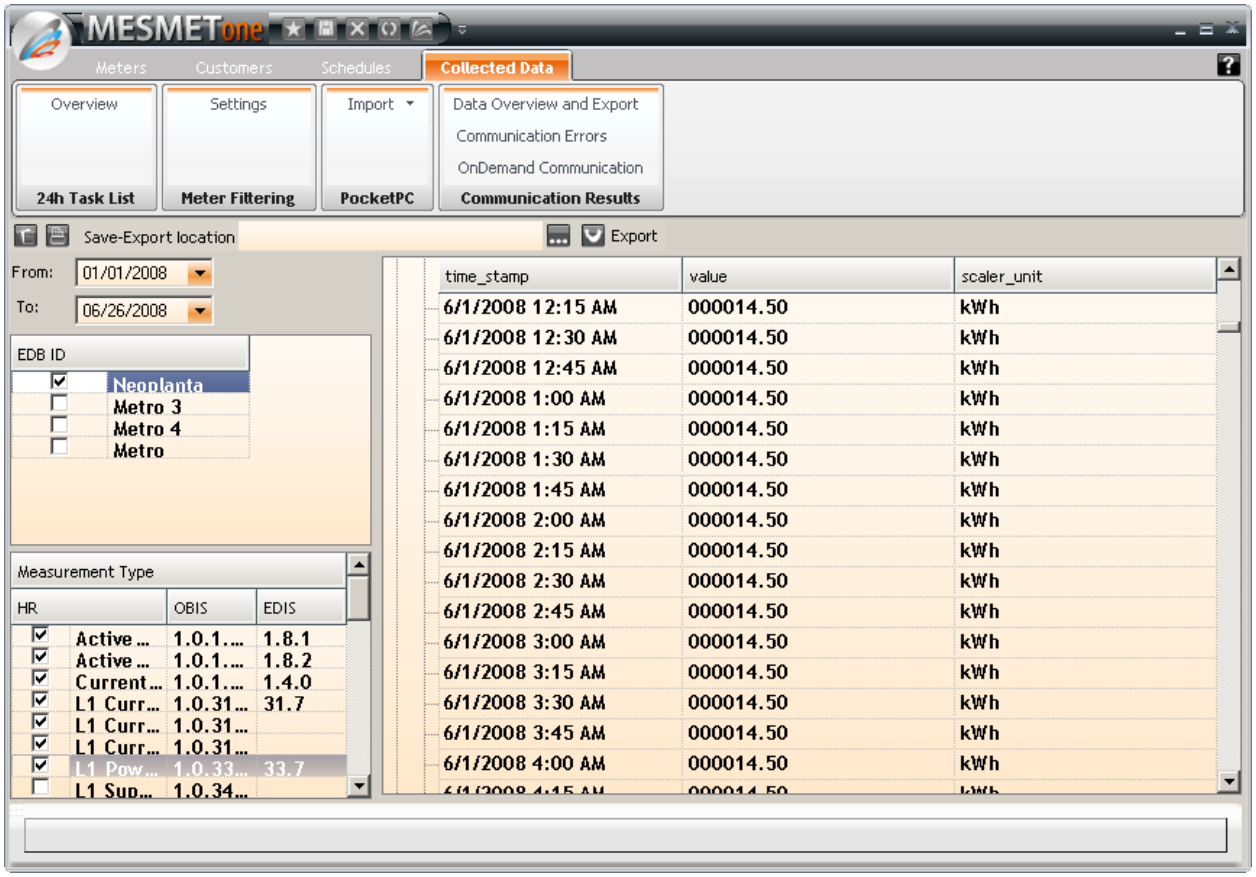


Fig. 4.7 Collected data

After click on the *Show Data* button, data is shown in the tabular view, in the main part of the form. Click on *Print* button sends data to the printer. Data can be exported in .xls or .xml data format and saved to location chosen from browse dialog.

All buttons from main menu: *Add, Delete, Refresh* and Activate are disabled here.

1.4.4.2 Communication errors

This control is used for displaying errors that happened in communication. Boundaries of time period have to be inserted into fields *From* and *To*, to determine time window from which user wants to view errors in communication (fig. 4.8). Click on *Show* button displays all errors happened in pre-selected time interval. These errors are displayed in the main list. For each error it is shown it's *EDB ID*, *Execution Time* and *Error*. This list can be filtered.

Communication errors are shown only for meters that belong to the activated filter.

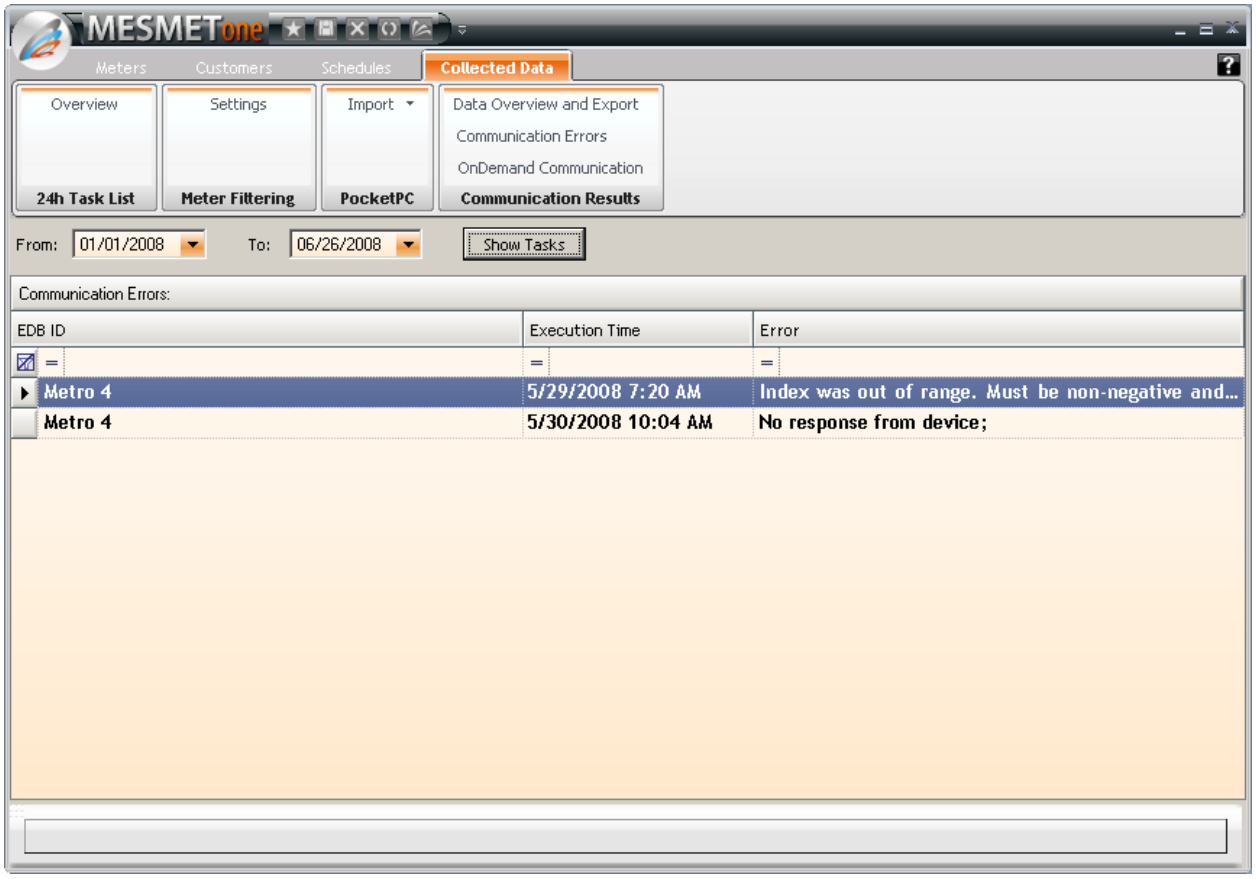


Fig. 4.8 Communication errors

All buttons from main menu: *Add, Delete, Refresh* and *Activate* are disabled here.

1.4.4.3 OnDemand Communication

This control consists of three parts: *Create Read OnDemand Command*, *Create Write OnDemand Command* and *Track OnDemand Command* (fig. 4.9). It depends of data from activated filter and shows only logical names available in selected meters.

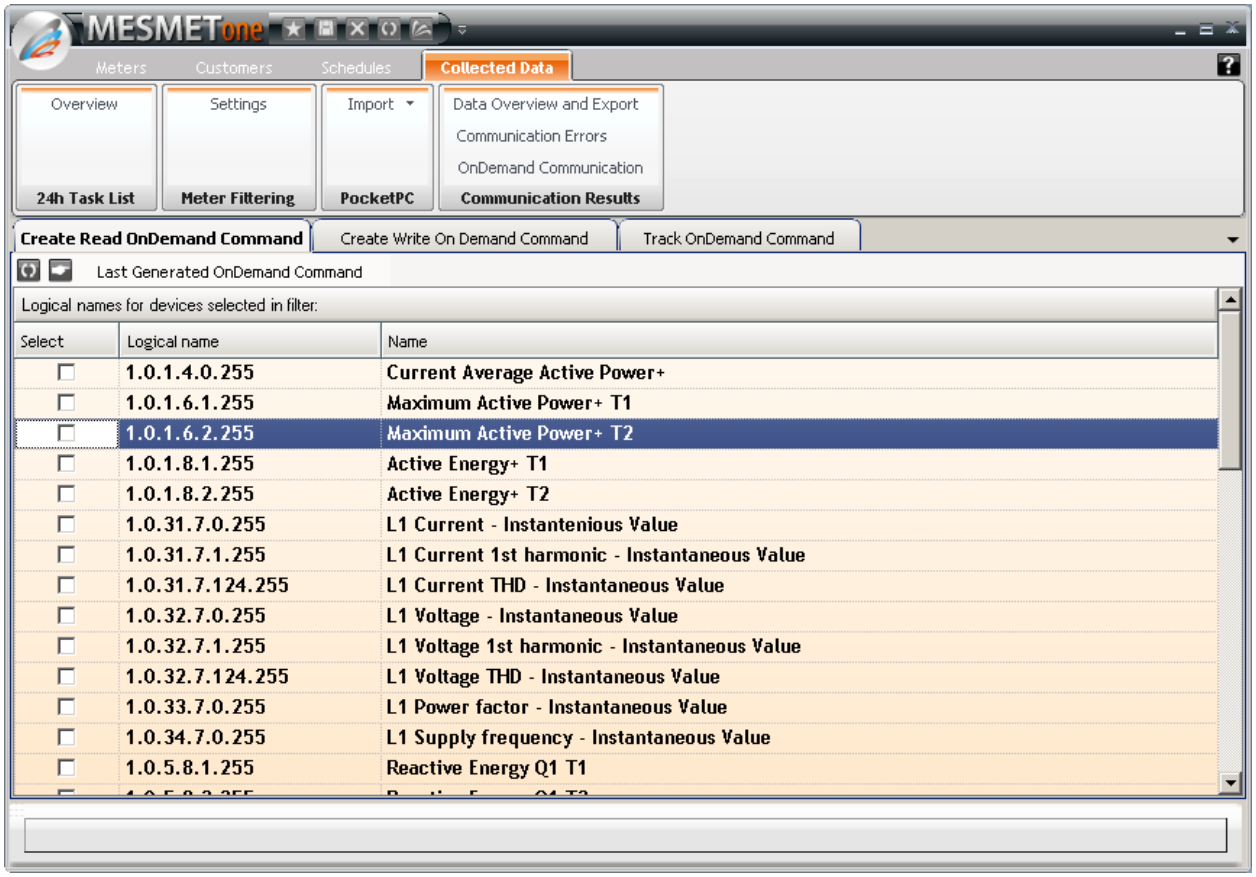


Fig. 4.9 OnDemand commands

1.4.4.3.1 Create Read OnDemand Command

This part is used to create Read OnDemand command. List of belonging to the types of meters in activated filter is displayed. *On demand read command* is created by checking desired objects in the list, and click *SendCommand* (Fig. 4.10). ID of newly sent command is shown in the field next to the *Last Generated OnDemand Command.* Click on *Refresh* refreshes on-screen data.

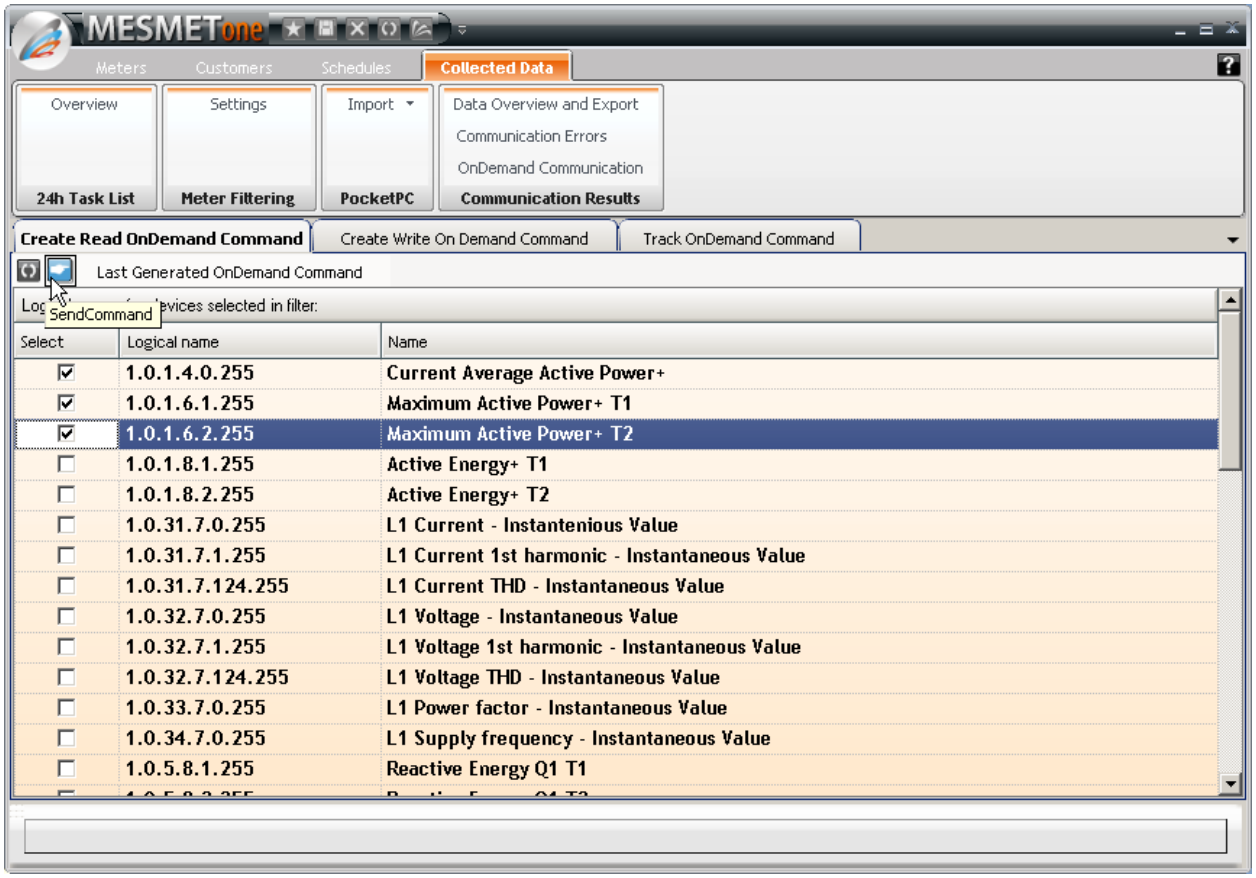


Fig. 4.10 Sending Read OnDemand command

1.4.4.3.2 Create Write OnDemand Command

This control consists of lists of all available Write OnDemand commands. New write OnDemand command is created by checking desired objects in the list and click on button *SendCommand*, and its id will be shown text to *Last Generated OnDemand Command* (Fig 4.11). Click on *Refresh* refreshes on-screen data.

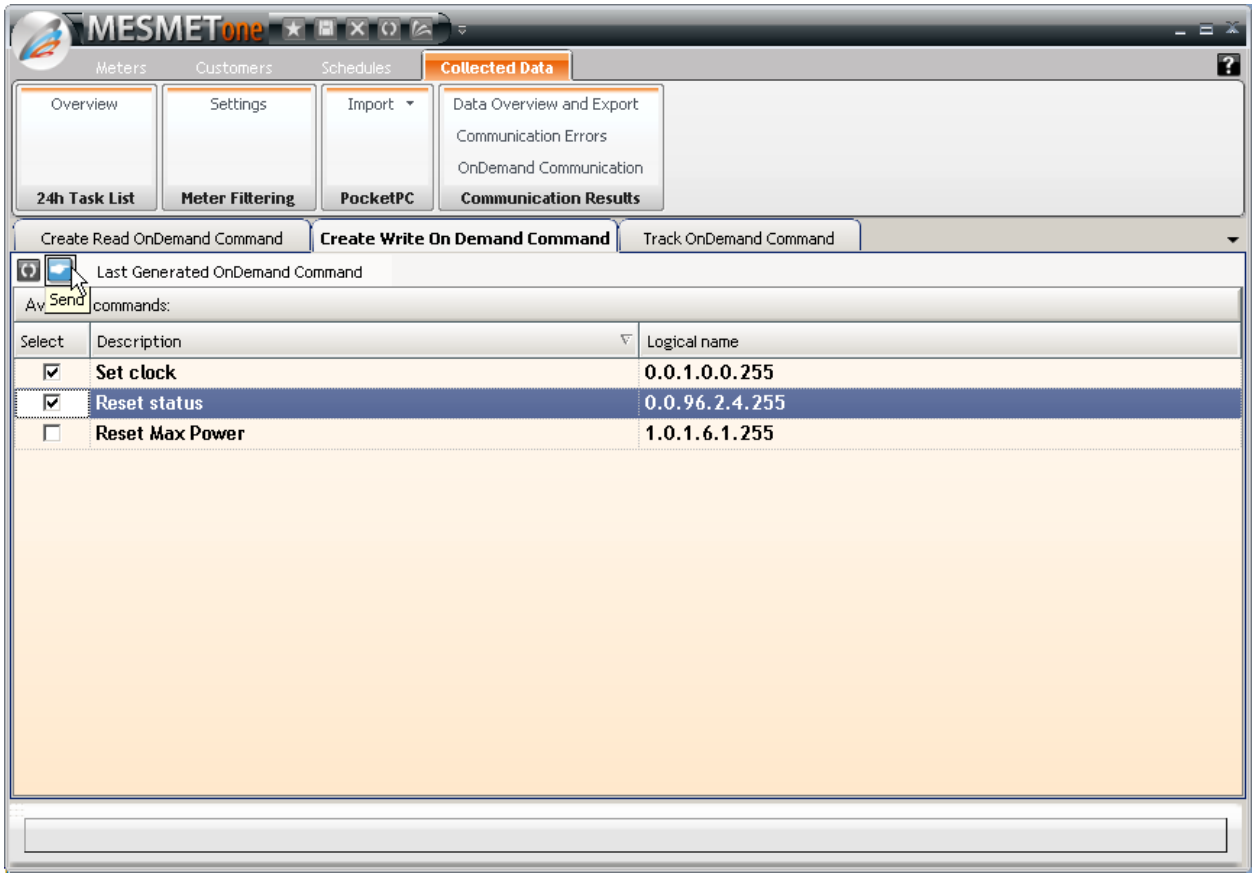


Fig. 4.11 Sending Write OnDemand command

1.4.4.3.3 Track OnDemand Command

Every OnDemand command can be tracked. It is needed to insert time period into fields *From* and *To*, to determine time window from which user wants to track *OnDemand* commands. Thereafter, click on the button next to combo-box named *Command ID* fills combo-box with all OnDemand commands created in selected time interval. After choosing a command from combo-box and click on the button next to *Track Command,* tasks from this command appear in the list *Tracked Devices*. For each task its status and meter's EDB ID are shown. Double click on task shows its details on the right side of the control. If it is Write OnDemand command its details are shown in list *Write OnDemand commands*, and if it is read then her results are shown in list *Read OnDemand command*. If a task had errors in execution, they are in the bottom of the control.

All buttons from main menu: *Add, Delete, Refresh* and *Activate* are disabled here.

2.Contact

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